

centrifuge No.:
user manual - Cat. No.:

MPW-352, MPW-352R, MPW-352RH
20352/R/RH.ENG



2013-04-05

USER MANUAL



LABORATORY CENTRIFUGE

MPW-352/R/RH



Read this before use!

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WARNING SIGNS AND HAZARD ICONS.

	WARNING! Warning of potential injury or health risk.
	DANGER! Risk of electric shock with potential for severe injury or death as a consequence.
	DANGER! Biohazard with potential for risk to health or death as a consequence.
	DANGER! Risk of explosion with potential for severe injury or death as a consequence.

This manual was prepared with special care. MPW MED. INSTRUMENTS may change the manual at any time and without notice because of improvements, typographical errors, inaccuracies of current information or improvements to facilities.

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1 Technical specification

manufacturer	MPW MED. INSTRUMENTS 46 Boremlowska Street, 04-347 Warsaw, Poland			
type	MPW - 352		MPW - 352R/RH	
mains voltage, L1+N+PE, $\pm 10\%$	230V	115V	230V	115V
mains frequency, $\pm 10\%$	50/60Hz		50Hz	60Hz
connected load (max.)	600W		980W	
current protection	6,3A	10A	10A	16A
cooling medium	-		R507 (CFC/HCFC free)	

	MPW - 352	MPW - 352R	MPW - 352RH
capacity (max.)	1000 ml		
speed – RPM	90 ÷ 18000 rpm (step 1 rpm)		
force – RCF	30065 x g (step 1 x g)		
kinetic energy (max.)	19148 Nm		
running time	00:00:01 ÷ 99:59:59 – [hours, min., sec] (step 1s)		
time counting	since start button is pressed / since preselected speed is reached		
short-time operation mode – SHORT	yes		
continuous operation mode – HOLD	yes		
user programmss	99 +1*		
adjustable temperature	-	-20 ÷ 40°C** (step 1°C)	-20 ÷ 55°C** (step 1°C)
initial cooling/heating PROG 99 (90 ÷ 2500 RPM)	no/no	yes/no	yes/yes
guaranteed temperature with max. rotor speed	-	≤4°C	
cooling/heating without centrifuging	no	yes/no	yes/yes
cooling/heating with centrifuging	no	yes/no	yes/yes
acceleration (ACEL)	10 linear curves		
deceleration (DECEL)	10 linear curves		
programmable non-linear curves:			
acceleration	10		
deceleration	10		
USB communication	yes		
Electromagnetic compatibility	according to PN-EN 55011		
ambient conditions	PN-EN 61010-1 pkt.1.4.1		
set-up site	indoors only		
ambient temperature	2° ÷ 40°C		
humidity (maximum relative humidity)	< 80%		
excess-voltage category	II	PN-EN 61010-1	
pollution degree	2	PN-EN 61010-1	
safety area	300 mm		
dimensions			
height (H)	380 mm	380 mm	
width (W)	443 mm	443 mm	
depth (D)	545 mm	695 mm	
with open cover (H _{oc})	768 mm	768 mm	
noise level	56 dB	56 dB	
weight 230V	41,8 kg	64,8 kg	65,7 kg
weight 115V	45 kg	70,9 kg	71,8 kg

* factory program (program no. 99)

**time and possibility of obtaining a set temperature is dependant on multiple factors , including: rotor type, established RPM, ambient temperature; accuracy: $\pm 1^{\circ}\text{C}$ appropriate for place of temperature sensor

Menu languages: POLISH, ENGLISH, SPANISH (without national characters).

2 Application

The MPW-352/R/RH centrifuges are table top laboratory centrifuge for in vitro diagnostic (IVD). Devices are used for separation samples taken from people's, animal's and plant's components of different densities, under the influence of the centrifugal force, to provide information about their biological state (MPW-352 – ventilated, MPW-352R – with cooling, MPW-352RH – with cooling and heating). Its construction ensures easy operation, safe work and wide range of applications at laboratories engaged in routine medical analyses, biochemical research works etc. This centrifuge is not biotight and therefore during centrifugation of preparations requiring biotightness one has to use closed and sealed containers and rotors. In the centrifuge, it is prohibited to centrifuge caustic, inflammable and explosive preparations.

3 Installation

Open the package. Remove the box containing the accessories. Take out centrifuge from the container. Keep the box and packing materials in case of service shipping.

name	qty (pcs.)	cat no.
centrifuge MPW-352/R/RH	1	see name plate
complete clamp	1	17664
spanner for the rotor	1	17665
spanner for emergency opening of the cover	1	17900
power cord 230V / 115V	1	17866/17867
fuse WTA T 6,3A 250V / WTA T10A 250V / WTA T16A 250V	2	17862/17863/17864
vaseline 20ml	1	17201
USB A-A cable, CD (MPW Editor application + FTDI USB drivers)	1	16598
user manual	1	20352/R/RH/ENG

3.1 Location

	▪ The centrifuge shall not be located near source of heat and shall not be subjected to direct sunlight. ▪ The table for the centrifuge shall be stable and shall have flat-levelled table top. ▪ It is necessary to ensure a safety zone of the minimum 30 cm round the centrifuge from every direction. ▪ Normal operating conditions ambient temperature is from 15°C to 35°C. Passed parameters of the centrifuge are referring to the above named temperatures. ▪ At the change of the place from cold to warm one, condensation of water will occur inside the centrifuge. ▪ It is important then that sufficient time be provided for drying the centrifuge prior to starting the centrifuge again (min. 4 hours).
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	▪ Supply voltage given on the rating plate has to be consistent with local supply voltage. MPW Med. instruments laboratory centrifuges are 1st safety class devices and they are provided with the three-core cable with the plug resistant to dynamic loadings. ▪ Mains socket shall be provided with the safety pin. It is recommended to install emergency cut-out that shall be located far from the centrifuge, near the exit or beyond the room.
	▪ Before switching on, check whether the centrifuge is connected to power supply correctly.

3.2 *Current protection*



The centrifuge is equipped with thermal current protection. Fuse is situated in the plug-in socket unit at back wall of the centrifuge.

4 Safety notes

4.1 *Operating personnel*

	▪ Laboratory centrifuge can be operated by laboratory personnel after getting acquainted with user manual. ▪ User manual shall be always held near the centrifuge. ▪ The centrifuge can not be misused.
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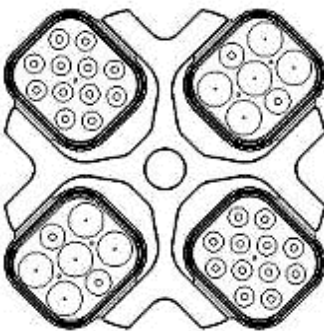
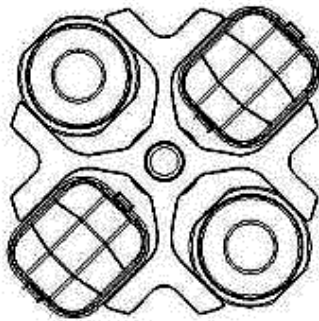
4.2 *Guarantee*

	▪ Guarantee period amounts to minimum 24 months (unless otherwise specified in the purchase documents). ▪ The service life of the centrifuge specified by the manufacturer amounts to 10 years. ▪ After termination of guarantee period it is necessary to carry out yearly technical inspections of the centrifuge. ▪ Manufacturer reserves the right to make technical changes in manufactured products. ▪ Maximum period of storage of not used centrifuge amounts to 1 year. After this period, a service authorized by manufacturer should carry out technical inspection of the centrifuge.
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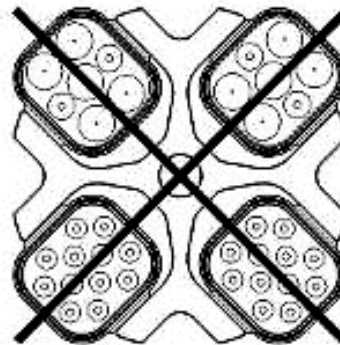
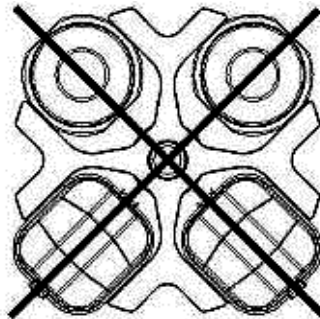
4.3

Loading the rotor

- Fix the rotor on the motor axis firmly.
- Avoid unbalance.
- Load opposite buckets with the same accessories.
- Centrifugation of the test tubes of different sizes:
 - There is a possibility to centrifuge test tubes of different sizes; however, it is absolutely necessary in such cases that opposite buckets and round carriers be the same.
 - Mass of different containers with test tubes spun at the same time has to be comparable. Swing-out rotors must be equipped with all four buckets.
- Lubricate the swing-out rotor journal pins.



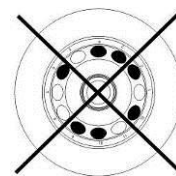
CORRECT



WRONG



CORRECT



WRONG

- It is necessary to insert test tubes symmetrically on the opposite sides.

	FILLING TUBES ▪ Fill test tubes outside the centrifuge. ▪ Please pay special attention to the quality and proper thickness of the glass test tubes walls. Those shall be test tubes for centrifuges. ▪ Fill test tubes outside the centrifuge.
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4.4 *Safety hints*

	ROTORS MAINTENANCE ▪ Lubricate the swing-out rotor journal pins. ▪ Use only accessories in good condition. ▪ Protect equipment against corrosion using accurate preventive maintenance.
	HS accessories maintenance ▪ HS accessories maintenance. ▪ Make sure that rubber O-rings are lightly coated with silicone grease. Use high vacuum grease, e.g. type „C” by LUBRINA.

	HAZARDOUS MATERIALS ▪ Infectious materials could be processed in closed buckets only. ▪ It is not allowed to subject to centrifugation toxic or infectious materials with damaged leak proof seals of the rotor or test-tube. Proper disinfection procedures have to be carried out when dangerous substances contaminated the centrifuge or its accessories.
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	EXPLOSIVE AND COMBUSTIBLE MATERIALS ▪ It is not allowed to centrifuge explosive and inflammable materials. ▪ It is not allowed to centrifuge substances prone to reacting in result of supplying high energy during centrifugation. Wirówka nie może pracować w środowisku grożącym eksplozją. ▪ It is not allowed to centrifuge materials capable of generating inflammable or explosive mixtures when subjected to air.
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4.5 *Maintenance conditions*

	START-UP ▪ Prior to switching the centrifuge on, one shall read carefully all sections of this instruction in order to ensure smooth operation and avoid damages of this device or its accessories. ▪ In order to protect the centrifuge against unbalance, fill in the test tubes up to the same weight.
	TRANSPORTATION ▪ Centrifuge must not be transported with the rotor mounted on the shaft..
	GENERAL HINTS ▪ One must use original rotors, test-tubes and spare parts only. ▪ In case of faulty operation of the centrifuge one shall ask for assistance of service of MPW MED. INSTRUMENTS company or its authorized representatives. ▪ It is not allowed to switch the centrifuge on if it is not installed properly or rotor is not fitted correctly.

	CENTRIFUGES SUBSTANCES ▪ It isn't allowed to exceed load limit set by the manufacturer. Rotors are intended for fluids of average homogeneous density equal to 1,2 g/cm³ or smaller when centrifugation is carried out at maximum speed. When fluids of higher density shall be used, then it is necessary to change density of centrifuges sample in PARAM/DENSITY field.
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4.6 *Safety precautions*

For safety reasons, inspections of the centrifuge carried out by the authorized service at least once a year after the period of warranty. The reason for more frequent inspections could be corrosion inducing environment. Examinations should end with issuing report of validation that checks on the technical state of the laboratory centrifuge. It is being recommended to establish document where every repairs and reviews are being registered. Both these documents should be stored in the place of use of the centrifuge.

	INSPECTION PROCEDURES CARRIED OUT BY THE OPERATOR Operator has to pay special attention to the fact that the centrifuge parts of key importance due to safety reasons are not damaged. This remark is specifically important as for: ▪ Motor suspension ▪ Motor axis concentricity ▪ Fixing the pins in the bucket. ▪ Centrifuge accessories and especially structural changes, corrosion, preliminary cracks, abrasion of metal parts.
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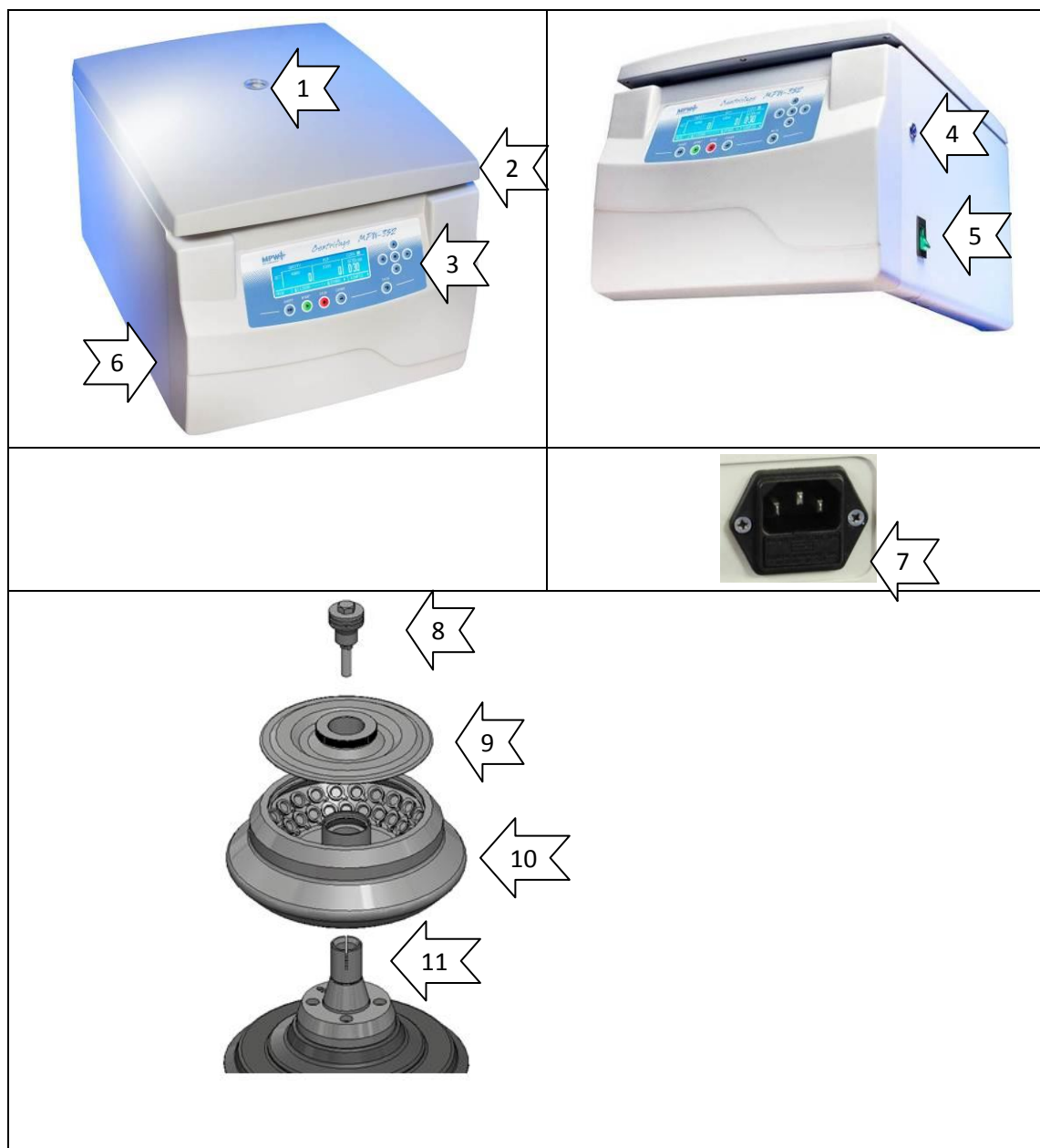
	▪ Screw joints. ▪ Inspection of the rotor assembly. ▪ Inspection of bioseals of the buckets if such are used. ▪ Control of execution of the guarantee yearly technical inspection of the centrifuge Only the manufacturer-specified holders, included in the equipment list, as well as centrifuge capillaries, which diameter, length and durability are suitable, should be used for spinning in this centrifuge. The use of equipment made by other manufacturers should be consulted with the manufacturer of the centrifuge. ▪ It is not allowed to lift or shift the centrifuge during operation, and rest on it. ▪ It is nor allowed to stay in the safety zone within 30 cm distance around the centrifuge neither leave within this zone some things, e.g. glass vessels. ▪ It is not allowed to put any objects on the centrifuge.
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	COVER OPENING
	▪ It isn't allowed to open the cover manually in emergency procedure when rotor is still turning.
	ROTORS
	▪ It is not allowed to use the rotors and round carriers with signs of corrosion or other mechanical defects. ▪ It is not allowed to centrifuge highly corrosive substances which may cause material impairment and lower mechanical properties of rotor and round carriers. ▪ It isn't allowed to use rotors and accessories not admitted by the manufacturer. Let to use commercial glass and plastic test tubes, which are destined to centrifuging in this laboratory centrifuge. One should absolutely not use poor quality elements. Cracking of glass vessels and test tubes could result in dangerous vibration of the centrifuge. ▪ It is not allowed to carry out centrifugation with the rotor caps taken off or not driven tight.

5 Operating

New generation of MPW MED. INSTRUMENTS laboratory centrifuges is provided with state-of-the-art microprocessor control systems, very durable and quiet asynchronous brushless motors and accessories consistent with requirements of the present-day user.

5.1 Centrifuge description



1. inspection glass	7. mains socket
2. cover	8. clamp
3. control panel	9. rotor cover
4. emergency cover opening	10. rotor
5. power switch	11. motor axle
6. USB port	

5.2 *Design*

The centrifuge has rigid self-supporting structure. Housing was made of sheet aluminium, back made of steel sheet. Front and cover was made of ABS type plastic. Cover is fixed on steel axles of hinges and from the front it is locked with two electromagnetic locks blocking possible opening during centrifugation. Rotation chamber casing was made of thick steel sheet. The rotation chamber bowl is made of stainless steel sheet. Rotors and containers are from aluminium, lids from polycarbonate and reductive inserts from the polypropylene.

5.3 *Rotor and accessories installation*

- Connect the centrifuge to the mains (master switch on left side of the centrifuge).
- Open the cover of the centrifuge by pressing the **COVER** key. Prior to putting the rotor in, one has to check if the rotating chamber is free of impurities, e.g. such as dust, glass splinters, residues of fluids that must be taken away.
- One shall fit the rotor on the motor shaft driving it home on the cone.



Fitting the rotor too shallow will result in lack of identification of the rotor after start of the centrifuge, displaying the error message and stopping the centrifuge.

- Screw-in the bolt for fixing the rotor (clockwise) and screw it tightly home with the supplied spanner for the rotor.
- Swing-out rotors have to be provided with the buckets in all seats. One should remember that every buckets swings individually. Bucket suspension studs should be lubricated periodically with technical petroleum jelly.
- In case of rotors designed with the cover they must not be used without it. Rotor covers must be closed exactly. Rotor covers ensure smaller drags of the rotors, proper setting of the test-tubes and airtight sealing.
- One should use only buckets intended for selected types of the rotor.
- Fill test tubes outside the centrifuge.
- Put on or screw the caps on vessels and rotors (if applicable).
- In case of centrifuging in an angle rotor, test tubes (buckets) have to be filled properly in order, próbówki (pojemniki) muszą być odpowiednio napełnione w celu uniknięcia wylewania.



Centrifuge will tolerate small weight differences occurring during loading of rotors. However it is recommended to equalize vessels loads as much as possible in order to ensure minimal vibrations during operation. When the centrifuge is started with large imbalance, the unbalance control system will switch-off the drive system and error signal will be transmitted. On the monitoring panel, error message will be displayed.

- In order to prolong lifetime of the rotor and gaskets rotors shall be lubricated with the maintenance oil, while gaskets and threaded parts shall be lubricated with the technical petroleum jelly.

- For replacement of the rotor one shall unscrew clamping and then grab the rotor with both hands at opposite sides, taking it away from drive shaft by pulling it up.

5.4 Control device

The microprocessor control unit of the centrifuge ensures broad possibilities of providing, realisation and reading of work parameters.

5.5 Setting parameters

Data setting and read-out system forms hermetically closed keyboard with distinctly accessible operation points. Easily readable displays signaling individual performed operations facilitate operator's programming and recording of parameters and condition of the centrifuge. The centrifuge is provided with the USB interface that enables connection of the centrifuge to external PC unit with the printer and recording the centrifugation parameters.

5.6 Safety features

Cover lock

The centrifuge can be started only with properly closed cover. While, the cover can be opened only after stopping the rotor. In case of emergency opening of the cover during operation, the centrifuge will be immediately switched-off and the rotor will brake till complete stopping.

Unbalance detecting

When loads of opposite buckets or carriers in rotors are unbalanced, the drive will be switched-off during acceleration or operation of the centrifuge – and the error message will be displayed.

Rotor verification and checking compatibility with loaded program

Directly after starting centrifuging, a unit verifies the type of the rotor applied and in the case of its incompatibility with the type indicated in the application or absence of the rotor, the spinning process shall be stopped with simultaneous displaying the error message. The conformity of the type of the rotor is signalled with a single audible signal. Program no. 99 can be run without setting rotor, but the rotor must be supported by the centrifuge.

Rest state inspection

Opening of the centrifuge's cover is possible only with the rotor in the state of rest. When the rotor is being stopped, the STOP diode is on and goes off when it is stopped. (excepting emergency cover opening) – see p. TROUBLESHOOTING.

Checking of excessive temperature

If temperature in rotation chamber exceeds 50°C (MPW-352) / 65°C (MPW-352RH) caused by, for example, malfunction of cooling system, drive will be switched off and error message will be displayed. The reboot is only possible after chilling device.

6 Centrifugation

Power switching ON/OFF is carried out with master switch situated on the side wall of the centrifuge. All settings on the centrifuge are done by means of the control panel.

6.1 Control panel

The control panel placed on the front casing serves the purpose of controlling centrifuge operation.



Control panel

▶▶	SHORT ¹	short-time centrifuging		
▶	START	start centrifugation run		
■	STOP ²	end centrifugation run		
🔧	COVER	cover opening		
↶	BACK	back buton	/	cancelling
▲	UP	navigating in menu	/	increasing values
▼	DOWN	navigating in menu	/	decreasing values
SET / •	SET	changing parameters	/	confirming changes
◀	LEFT	navigating in menu	/	
▶	RIGHT	navigating in menu	/	

¹ the centrifuge is working as long as the key is pressed

² first-time pressing press – will make stopping centrifuging with acceleration characteristics set in the current program (confirm message with pressing STOP or BACK key), second-time pressing – will make the centrifuging as fast as possible (quickest characteristic). During setting of the parameters, it serves for exiting zones on the primary screen without introducing changes.

6.2 Display

The display is located in the centre of the control panel. The main screen variants are presented below.

MAIN SCREEN	
MPW-352	
MPW-352R/RH	

SPEED	rotor speed	assigned/measured
RCF	centrifugal force	assigned/measured
TIME	centrifuging time	assigned/measured
TEMP	temperature	assigned/measured
PROG —	program no.	
11199 / —	rotor no.	
PARAM	parameters of the centrifuge	
CONFIG	configuration menu	

	changing values		
	user acc/dec curves (ACC/DEC 10-19)		
	density > 1,2 g/cm ³		
	counting time down (decreasing)		counting time up (increasing)
	cooling to set temperature		heating to set temperature
	centrifuging		centrifuging (with automatic cover opening)
	rotor stopped / closed cover		rotor stopped / opened lid
	stopping rotor		fastest decelerating
	identifying rotor		
	thermal chamber		
	temperature delay		
	time delay		
	zone mark of assigning of the centrifuging time		
	drop-down list		

	temporarily disabled		
	locked		
	time counting (blinking)		
	disabled option / drop-down list		active option / drop-down list
	disabled option		active option

6.3 *Centrifuging notes*

- Connect the centrifuge to the mains (master switch on left side of the centrifuge).
- Open the cover of the centrifuge by pressing the **COVER** key. Prior to putting the rotor in, one has to check if the rotating chamber is free of impurities, e.g. such as dust, glass splinters, residues of fluids that must be taken away.
- One shall fit the rotor on the motor shaft driving it home on the cone.

	Fitting the rotor too shallow will result in lack of identification of the rotor after start of the centrifuge, displaying the error message and stopping the centrifuge.
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- Screw-in the bolt for fixing the rotor (clockwise) and screw it tightly home with the supplied spanner for the rotor.
- Swing-out rotors have to be provided with the buckets in all seats. One should remember that every buckets swings individually. Bucket suspension studs should be lubricated periodically with technical petroleum jelly.
- In case of rotors designed with the cover they must not be used without it. Rotor covers must be closed exactly. Rotor covers ensure smaller drags of the rotors, proper setting of the test-tubes and airtight sealing.
- One should use only buckets intended for selected types of the rotor.
- Fill test tubes outside the centrifuge.
- Put on or screw the caps on vessels and rotors (if applicable).
- In case of centrifuging in an angle rotor, test tubes (buckets) have to be filled properly in order to avoid overflows.

	Centrifuge will tolerate small weight differences occurring during loading of rotors. However it is recommended to equalize vessels loads as much as possible in order to ensure minimal vibrations during operation. When the centrifuge is started with large imbalance, the unbalance control system will switch-off the drive system and error signal will be transmitted. On the monitoring panel, error message will be displayed.
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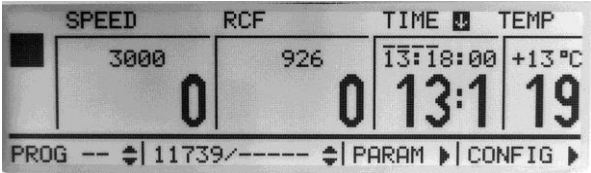
- In order to prolong lifetime of the rotor and gaskets rotors shall be lubricated with the maintenance oil, while gaskets and threaded parts shall be lubricated with the technical petroleum jelly.
- For replacement of the rotor one shall unscrew clamping and then grab the rotor with both hands at opposite sides, taking it away from drive shaft by pulling it up.

6.4 Setting up RPM, RCF, TIME, temperature

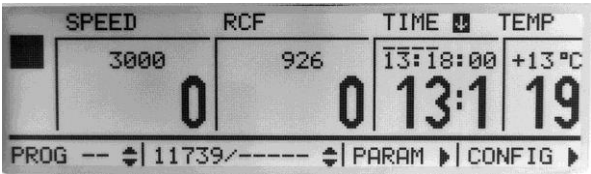
On the main screen, it is possible to set:

rotating speed	SPEED (RPM)
relative centrifugal force	RCF
centrifuging time	TIME
centrifuging temperature	TEMP (R/RH only)

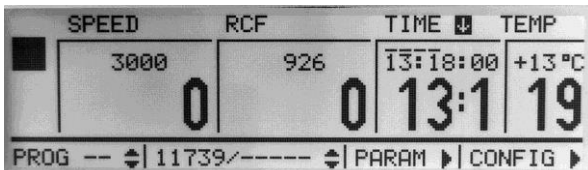
Exemplary change of **SPEED** setting:

	- Press SET (to enter edit mode). - With ▲▼◀▶ keys mark SPEED fold (blinking).
	- Press SET. - Choose demanded order of magnitude by pressing ◀▶, e.g.: Xxxx (X - blinking). - Set demanded value by pressing ▲▼. - Repeat above two steps for other orders of magnitude. - Confirm set value by pressing SET. - Leave edit mode by pressing BACK.
When RPM is changed, RCF is automatically corrected.	

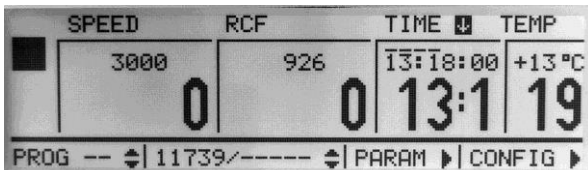
Exemplary change of **RCF** setting:

	- Press SET (to enter edit mode). - With ▲▼◀▶ keys mark RCF fold (blinking).
	- Press SET. - Choose demanded order of magnitude by pressing ◀▶, e.g.: Xxx (X - blinking). - Set demanded value by pressing ▲▼. - Repeat above two steps for other orders of magnitude. - Confirm set value by pressing SET. - Leave edit mode by pressing BACK.
When RCF is changed, RPM is automatically corrected.	

Exemplary change of **TIME** setting:

	▪ Press SET (to enter edit mode). ▪ With ▲▼◀▶ keys mark TIME fold (blinking).
	▪ Press SET. ▪ Choose demanded order of magnitude by pressing ◀▶, e.g.: Xx:xx:xx (X - blinking). ▪ Set demanded value by pressing ▲▼. ▪ Repeat above two steps for other orders of magnitude. ▪ Confirm set value by pressing SET. ▪ Leave edit mode by pressing BACK.

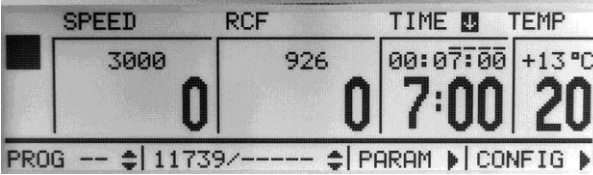
Exemplary change of **TEMP** setting:

	▪ Press SET (to enter edit mode). ▪ With ▲▼◀▶ keys mark TEMP fold (blinking).
	▪ Press SET. ▪ Set demanded value by pressing ▲▼. ▪ Confirm set value by pressing SET. ▪ Leave edit mode by pressing BACK.

Changing parameters during run

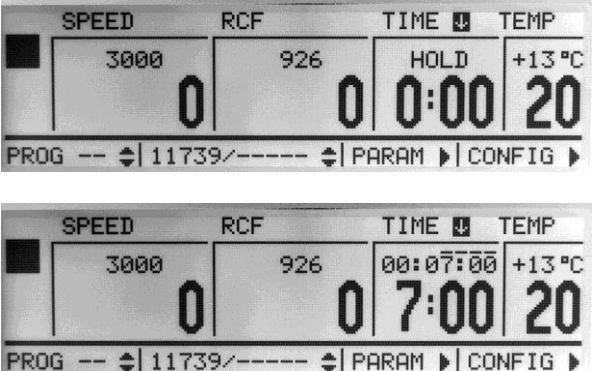
	There is a possibility to change parameters: SPEED, RCF, TIME, TEMP during centrifuging. Such modifications give in currently running program. Modification during run is represented by PROG — symbol.
---	--

Detailed description of setting values (e.g. **TIME**).

	▪ Press SET (to enter edit mode). ▪ With ▲▼◀▶ keys mark TIME fold (blinking).
0 0 : 0 7 : 0 0 hh : mm : ss e.g.: ▪ centrifuging time – 4 minutes 19 seconds	▪ Press SET. ▪ Choose “hours”, “minutes” or “seconds” by pressing ◀▶, e.g.: XX:xx:xx (XX - blinking). ▪ Set demanded value by pressing ▲▼. ▪ Repeat above two steps to set demanded time. ▪ Confirm set value by pressing SET. ▪ Leave edit mode by pressing BACK.
00:07:00	set value
7:00	current value (most significant digits)
-----	— — — — symbol shows which orders of magnitude are currently shown in current value fold

HOLD mode	continuous operation mode
	▪ To run centrifuging in HOLD mode set 00:00:00 time. ▪ To end centrifuging in HOLD mode press STOP.

6.5 User programs

	After switching centrifuge on, program that was used in previous session is being loaded. Modification during run is represented by PROG — symbol.
---	---

Choosing program:

FAST MODE:

- Press **SET**.
- With **▲▼◀▶** keys mark **PROG** — fold (blinking). Wcisnąć klawisz **SET**.
- Set demanded program by pressing **▲▼**.
- Confirm by pressing **SET**.

LIST:

- Press **SET**.
- With **▲▼◀▶** keys mark **PROG** — zone.
- Press **SET**.
- With **▲▼** keys choose demanded program number. (marked by **▶**).
- Confirm by pressing **SET**.
- With **▲▼** keys choose one of four possibilities: **LOAD, SAVE, DELETE, NEW**:
 - ▶ – currently loaded program.
- **LOAD** – load program,
- **ZAPIS** – save settings as a program (confirm by selecting **YES** and pressing **SET**)
- **DELETE** – delete program (confirm by selecting **YES** and pressing **SET**)
- **NEW** – load default parameters:
 - TEMPERATURE: **+20°C**,
 - SPEED: **2000 RPM**,

- TIME: 2 min.

6.6 Programs with user characteristics

Loading a modified program in the **CURVES** fold is signalled by the icon on the main screen:

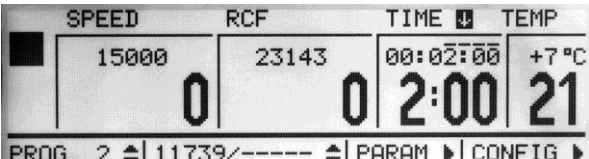
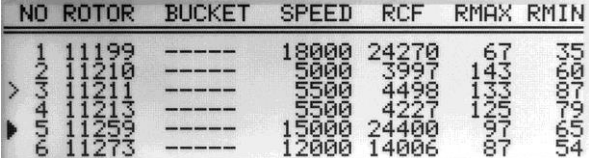
	Icon  signals that program with user acceleration/deceleration characteristics is loaded.
---	---

Since curves created by the user are connected with the number of the rotor and the value of speed set, loading of a program modified in such a way is subject to certain limitations. There is no possibility to change set speed and the rotor number (even when the centrifuge is not working). It is possible to modify the number of characteristics connected with the program in the PARA fold; setting ACEL and DECEL within the range 0 - 9 switches centrifuging process to default characteristics and the limitations are no longer applicable

It is not possible to change parameters (speed, rotor no. and others) during run, when program with user characteristic is loaded. Changing these parameters is possible in **PARAM/ACEL**, **PARAM/DECEL**.

6.7 Choosing rotors

There are two ways to select rotor:

	FAST MODE
	▪ Press SET. ▪ With ▲▼◀▶ keys mark — / — zone. ▪ Press SET. ▪ With ▲▼◀▶ keys mark choose demanded rotor. ▪ Confirm by pressing SET.
	LIST
	▪ Press SET. ▪ With ▲▼◀▶ keys mark  symbol. ▪ Press SET. ▪ With ▲▼◀▶ keys select rotor number. ▪ Confirm by pressing SET.

6.8 *SHORT mode*

	SHORT mode
	In SHORT mode the centrifuge is working as long as the ►► (SHORT) key is pressed or when set time is over.

6.9 *Terminating centrifugation*

	STOPPING CENTRIFUGATION CYCLE
	When preselected time is reached, centrifugation will end automatically.
 x1	Pressing STOP for the first time will stop centrifuging with the characteristic set in loaded program. Confirm message by pressing STOP lub SET.
 x2	Pressing STOP second time will stop centrifuging with the fastest characteristic.

7 Temperature control



MPW-352R/RH only

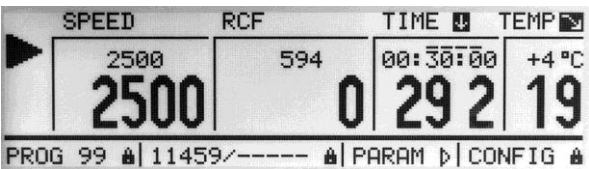
Centrifuge is equipped in ecological refrigerating system with temperature control. During centrifugation, there may appear differences in temperature on the display and temperature of the samples in the rotor. It depends on thermal conductivity of the rotor, and samples and centrifugation time.

Exemplary change of **TEMP** setting:

	- Press SET (to enter edit mode). - With ▲▼◀▶ keys mark TEMP fold (blinking). Press SET.
	- Set demanded value by pressing ▲▼. - Confirm set value by pressing SET. - Leave edit mode by pressing BACK.
	When chamber is being cooled or heated, symbol is visible on the screen (blinking).

7.1 Initial cooling (R/RH) or heating (RH) with centrifuging

 90 ÷ 2500 RPM	- In order to centrifuge preparations of a lowered temperature (deposited in the outside refrigerator) it is necessary to make initial refrigerating of the chamber, the rotor and containers, to the set low temperature, in order to minimise the difference of temperatures - Initial cooling/heating function can be activated by executing PROGRAM 99. Parameters: - TEMPERATURE, - SPEED: 90 ÷ 2500 RPM, - TIME. Initial cooling/heating functions can be terminated anytime by pressing STOP key.
----------------------	--

	When cooling/heating function is active,  /  symbol is visible on the screen (blinking). When Initial cooling or heating is active, PROG 99 and arrows  /  are visible (blinking) in TEMP fold.
---	---

7.2 Initial cooling (R/RH) or heating (RH) without centrifuging – THERMAL CHAMBER

	CONFIG → THERMAL CHAMBER
	- There is possible to run centrifuge in THERMAL CHAMBER mode - cooling for R, cooling and heating for RH (rotor is at standstill). - How to enable THERMAL CHAMBER is described in Parameters of centrifugation chapter.

7.3 Cooling (R/RH) or heating (RH) in “START DELAY – OF TEMPERATURE” mode

	CONFIG → START DELAY – OF TEMPERATURE
	- Centrifuging process will start, when preselected temperature is reached. - How to enable run START DELAY – OF TEMPERATURE function is described in Parameters of centrifugation chapter.

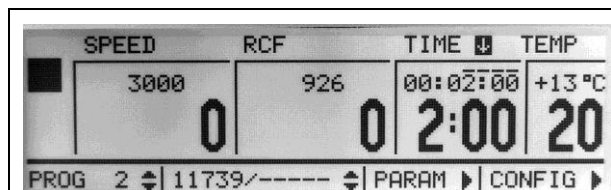
7.4 Cooling (R/RH) or heating (RH) in „SHORT mode

	- Cooling and heating features are available in SHORT mode. - How to enable run centrifugation in SHORT mode is described in Centrifugation/SHORT mode.
---	---

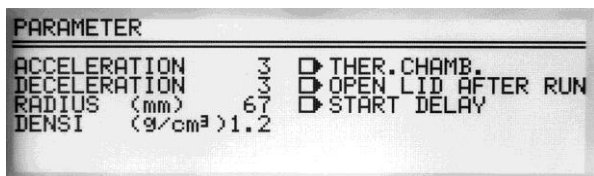
7.5 *Cooling (R/RH) and heating (RH) notes*

Centrifuges with cooling (R) or cooling and heating (RH) are equipped with an efficient cooling system. It allows obtaining selected temperatures in the chamber even at maximum spin speed or fast obtaining desired temperatures (e.g. 4°C and 36°C). Note that time and possibility of obtaining a set temperature is dependent on multiple factors, including: the power of the cooling system, the shape of the rotor, the rotor speed, ambient temperature, etc. The accuracy of the temperature stability of $\pm 1^{\circ}\text{C}$ is determined by the installation place of the temperature sensor.

8 Parameters of centrifugation



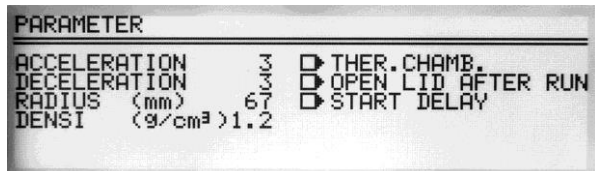
- Press **SET**.
- With **▲ ▼ ◀ ▶** keys select **PARAM**. Press **SET** (to enter PARAM menu).



ACCELERATION	chosen acc. characteristic
DECELERATION	chosen dec. characteristic
RADIUS [MM]	current rotor radius
DENSI (g/cm ³)	sample density

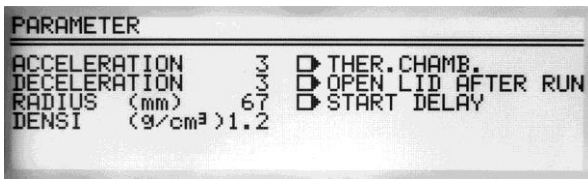
THER. CHAMB.	cooling / cooling and heating of the chamber
OPEN LID AFTER RUN	opening cover after centrifuging automatically
START DELAY	starting delayed (after pressing START)

8.1 Accelerating/decelerating – changing characteristics

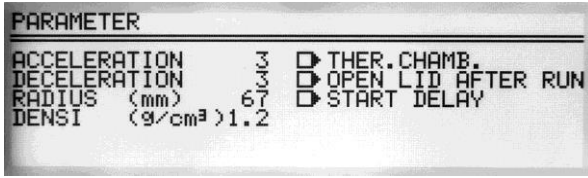
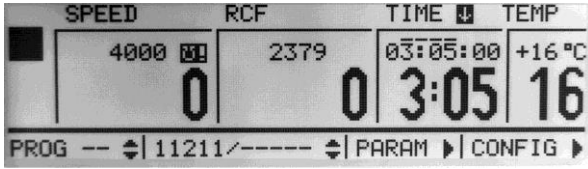


- **ACCELERATION** – 10 linear accelerating characteristics assigned to every rotor (**0 ÷ 9**),
- **DECELERATION** – 10 linear decelerating characteristics assigned to every rotor (**0 ÷ 9**).

8.2 Radius

	▪ RADIUS [mm] - control of the radius of the rotor within the range from R_{min} to R_{max}. Available values depends on chosen rotor, see — / — (LIST OF ROTORS fold).
	▪ When radius is changed is activated,  symbol is visible on the screen. ▪ Reducing of the rotor radius (and the resulting change of displayed RCF value) applies until switching off the power supply of the centrifuge or setting the R_{max} maximum radius once again (loading the program does not change this setting!). ▪ To change the rotor radius select RADIUS [mm] with $\blacktriangle \blacktriangledown \blacktriangleleft \blacktriangleright$ keys. [MM]. Press SET. Set demanded value by pressing $\blacktriangle \blacktriangledown$. Press SET to accept changes.

8.3 Sample density

	▪ DENSI (g/cm³) – default density is set to 1,2 g/cm³ (possible values 1,2 ÷ 9,9 g/cm³).
	▪ When density is changed,  symbol is visible on the screen. ▪ Increasing density of the sample above 1,2 g/cm³ (and limiting of the maximum speed of centrifuging resulting from it) applies until switching off power supply of the centrifuge or setting the device back to 1,2 g/cm³. ▪ To change the density select DENSI (g/cm³) with $\blacktriangle \blacktriangledown \blacktriangleleft \blacktriangleright$ keys. [MM]. Press SET. Set demanded value by pressing $\blacktriangle \blacktriangledown$. Press SET to accept changes.

8.4 Thermal chamber



MPW-352R/RH only

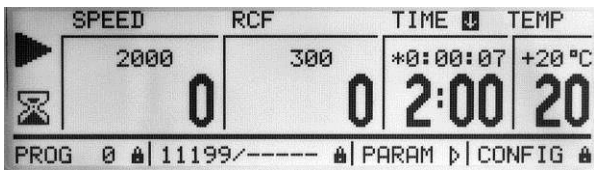
	THERMAL CHAMBER
	- With ▲▼◀▶ keys select THERMAL CHAMBER. Press SET (to turn on/off). - Set demanded value by pressing ▲▼.
	- When THERMAL CHAMBER function is activated, T symbol is visible on the screen. - Changing temperature from the main screen is not possible. - Opening cover terminates THERMAL CHAMBER function (closing cover back turns it on).
- If THERMAL CHAMBER is turned on (in PARAM fold) and centrifugation completes, THERMAL CHAMBER will activate itself. - THERMAL CHAMBER can be only activated when any other program is not running.	

8.5 Automatic lid opening

Automatic lid opening	OPEN LID AFTER RUN
	- When centrifuge process is finished, cover will be opened automatically. - When centrifuging is terminated by pressing STOP, opening cover is possible by pressing COVER.
	Flag icon symbol means that OPEN LID AFTER RUN is active.

8.6 Start delay - of time

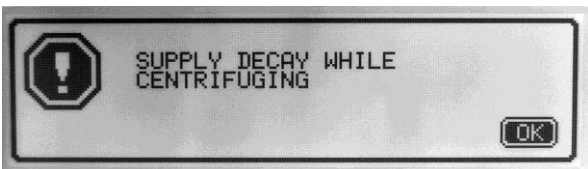
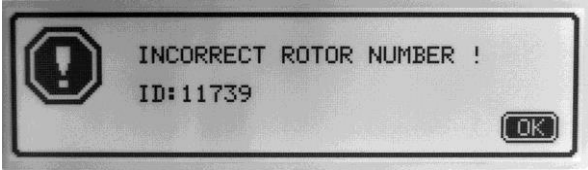
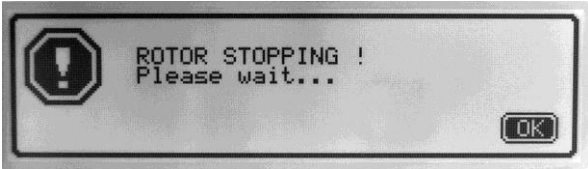
	Start centrifuging since preselected delay is reached.	START DELAY / OF TIME
--	--	-----------------------

	- With ▲▼ keys select START DELAY. Press SET. - Start delay can be set from 0:00:01 to 9:59:59. - With ▲▼ keys select OF TIME. Press SET. - Press ▼, then ► select time zone (e.g. 0:00:42). - With ▲▼ keys set demanded value. - Confirm by pressing SET.
	When START DELAY function is activated,  symbol is visible on the screen.  symbol informs that time is remaining.
START DELAY / OF TIME function cannot be run when START DELAY / OF TEMP. is activated.	

8.7 Start delay – of temperature

	MPW-352R/RH only
 2500 RPM	Start centrifuging since preselected temperature is reached.
	- With ▲▼ keys select START DELAY. Press SET. - With ▲▼ keys select OF TEMP. Press SET. - With ◀▶ keys select temperature zone. - With ▲▼ keys set demanded value.
	When START DELAY – OF TEMPERATURE is turned on,  symbol is visible on the screen.  /  (blinking) symbols means that temperature is increasing / decreasing.
When function is active, rotor is rotating with 2500rpm or lower (in order of fast temperature reaching).	
START DELAY / OF TEMP. function cannot be run when START DELAY / OF TIME is activated.	

8.8 Errors

End of centrifuging – manual mode	
	Centrifuging may be stopped at the any moment with the STOP key. The information message will be displayed.
End of centrifuging – normal mode	
	Stopping centrifuging in accordance with the set time causes generating 3 short audible signals (after stopping the rotor) and displaying the message.
Additional messages	
	In case of power shortage while centrifuging, after repeated switching it on, the following error screen will be displayed.
	After operating for 2000 hours, after every switching on the centrifuge the error screen is being displayed with information about the necessity to carry out servicing activities. After pressing the SET key, the device proceeds to the main screen and the device may operate.
	Identified number of the installed rotor. If the rotor is unknown the "--?--" sign is being displayed.
	Decelarating.
After pressing SET or STOP, the device returns to the main screen.	

Other messages	An irregularity in operations of the centrifuge is signalled by displaying a screen with relevant message (a sound signal is also emitted).
<pre> ===== SPEED OF ROTOR IDENTIFICATION <> 90 RPM ===== "SPEED OF ROTOR " "IDENTIFICATION <> 90 RPM" ===== UNBALANCE DETECTED ===== "IMBALANCE FAST STOP !" "PLEASE REMOVE CAUSE" "THEN RESTART" ===== ERROR OF ROTOR IDENTIFICATION {LIMIT OF 6SEC. IS OVER} ===== "NO ROTOR OR IDENTIFICATION" "SENSOR DAMAGED !" ===== ROTOR'S IDNOT CORRECT ===== "INCORRECT ROTOR NUMBER !" ===== WRONG DIRECTION OF ROTATION / UNKNOWN ROTOR ===== "WRONG DIRECTION OF ROTATION" "OR UNKNOWN ROTOR !" ===== CLOSING THE LID MANUALLY ===== "PLEASE CLOSE THE LID" "HAND !" ===== INITIALIZING AFTER MAINS FAILURE WITH ROTATING ROTOR ===== "ROTOR STOPPING !" "Please wait..." ===== CENTRIFUGING ENDED BECAUSE OF PRESSING STOP ===== " CYCLE'S ABORTED !" ===== CENTRIFUGING ENDED {WITROUT ERRORS} ===== " CYCLE'S FINISHED" </pre>	

Emergency messages	In case of emergency messages (centrifuge is not working properly) contact the manufacturer's authorized service center.
<pre> ===== INVERTET ERROR, INVERTER NOT READY {BETRIEBSBEREIT=1} ===== "OVERHEATING MOTOR !" "INVERTER ERROR !" "ERROR=" ; Kod_bledu ===== COMMUNICATION ERROR CONTROLLER - INVERTER {BLOK 1} ===== "INVERTER SERIAL BUS ERROR !" "ERROR=" ; Kod_bledu ===== TEMP. METER ERROR: DS18B20 ===== "TEMPERATURE SENSOR ERROR" "ERROR=" ; Kod_bledu ===== PRESSURE REGULATOR ERROR ===== "PRESSURE CONTROL FAILURE!" ===== COVER OPENED DURING RUN ===== "OPENING COVER in RUN!" ===== SPEED METER ERROR {NO IMPULSES } ===== "SPEED METER ERROR" ===== SEQUENCE OF 3 I2C TRANSMISSIONS FAULT; ===== "I2C BUS ERROR" "ERROR=" ; Kod_bledu ===== CENTRIFUGE OVERHEATED; CENTRIFUGE TEMPERATURE >= +50/+65 oC ===== "OVERHEATING CENTRIFUGE !" "Temp.= +"; _temp_przegrzania_off ; " oC" ===== 'V>VOGR_ROTOR ; ROTOR OVERSPEED {VOGR_ROTOR=VMAX_ROTOR+DELTA_VMAX} ===== "ROTOR OVERSPEED !" ===== COVER LOCK FAILURE ===== "COVER LOCK MALFUNCTION !" ===== SERVICE NEEDED; TIME {2000 HOURS} ===== "WORKING 2000 HOURS:" "CALL SERVICE FOR" </pre>	

8.9 Temporarily disabled functions

Functions written below can be temporarily disabled.

	SPEED	RCF	TIME	TEMP	PROG —	—— / ——	PARAM
THERMAL CHAMBER	●	●	●	○	●	●	●

During run

	SPEED	RCF	TIME	TEMP	PROG —	—— / ——	PARAM
PROG 99	○	○	○	○	○	○	○
ACC/DEC 10-19	○	○	●	●	○	○	●

Standstill

	SPEED	RCF	TIME	TEMP	PROG —	—— / ——	PARAM
PROG 99	○	○	○	○	●	○	○
ACC/DEC 10-19	○	○	●	●	●	○	●

- available
- disabled

8.10 Unbalance

The centrifuge is provided with the rotor unbalance sensor and when it will be activated, centrifugation process will be stopped through fast braking and at the same time an error message will be displayed. Cancellation of this error is possible only through pressing **COVER** key after stopping of the rotor.

One must check if rotor was correctly loaded, close the cover and once more start the program. In order to protect the rotor against beating in opposite areas of the rotor, it has to be provided with identically filled buckets, carriers, test-tubes etc. for getting the best balance possible.



Unbalance causes noise and vibrations during operation, and adversely affects power transmission system (motor, shock absorbers). The better balance, the smoother will be the centrifuge operation and therefore longer life of usage of the driveline. Moreover, the ideal separation level is then obtained, as already separated constituents would not be moved up by vibration.

Emergency stop

In any moment of centrifuging it is possible interrupt the process and fast stop the rotor. Single-time pressing of the STOP key will make centrifuging stop with acceleration characteristics set in the program (after pressing the SET or STOP key, the device returns to the main screen). Pressing and holding it up to 1s will make the centrifuging stop with the most strict characteristic.

8.11 Printing report - USB

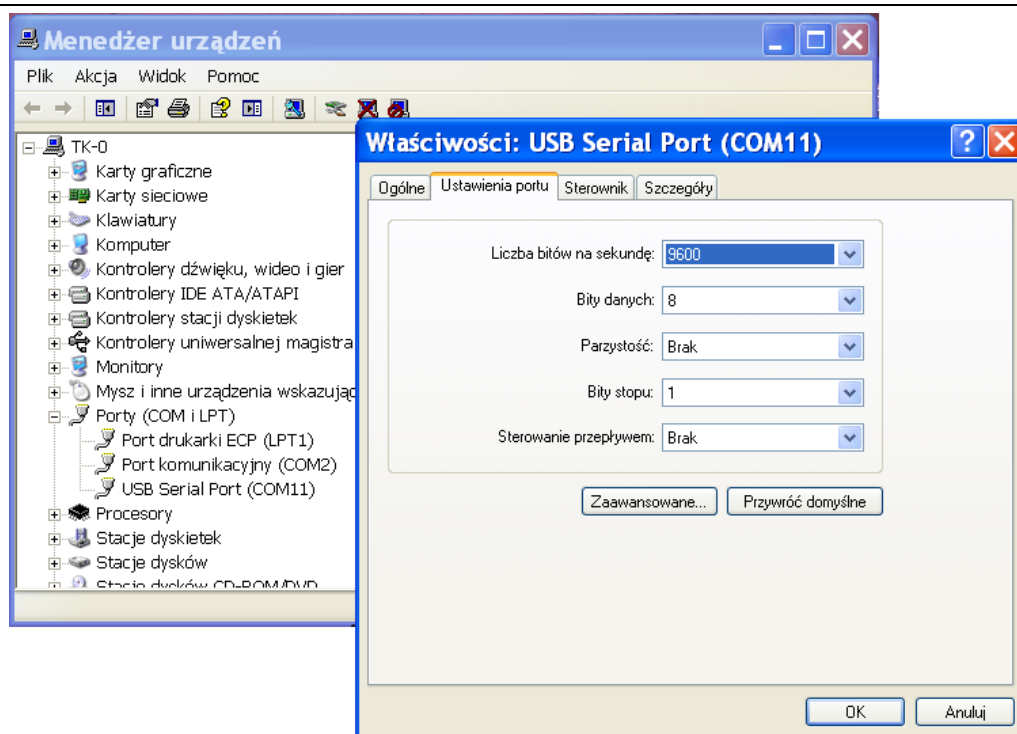
When the centrifuging process is finished there is a possibility to obtain report. Report can be transferred to PC or printed. Devices that offer printing reports are available optionally and they are not delivered with every centrifuge.

PC (USB)

name	quantity (pcs.)	cat. no.
USB A-A cable	1	16598
CD (MPW Editor application + FTDI USB drivers)	1	

	Preparation ▪ Connect centrifuge to the PC with the USB A-A cable (connection diagram is given below). ▪ if necessary install FTDI USB drivers (for details see attached CD). ▪ Ensure that virtual serial port COM (USB Serial Port) settings are set as described below (run control panel/system/ device manager): ▪ Baud rate = 9600 ▪ Data length = 8 ▪ Parity = none ▪ Stop bite = 1 ▪ Flow control = none
---	---

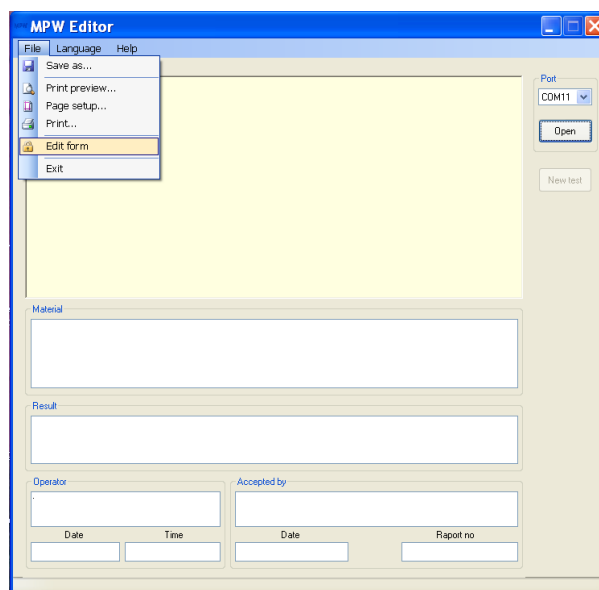
USB



- Install MPW Editor application (Windows) delivered on CD.

Centrifuging and printing report

- Run **MPW Editor** application.
- Choose **Język\English**
- Choose **COM** port assigned to the centrifuge (it will appear after connecting USB cable, e.g. COM11).
- Choose **File\Edit form**



- Fill individual folds (**optionally**).
- In the folds with explanatory caption „Tytuł (Title)”, there is a possibility to paste from system clipboard any picture (e.g. company logo).

MPW Editor

File Language Help

Tytuł (Title)

Port
COM11

Open

New test

Material
Próbka (Sample)

Result
Wynik (Result)

Operator
Wykonał (Examined by)

Accepted by
Zaakceptowane (Approved by)

Date Time Date Report no
123456

- Choose **File\Save form**
- Choose **Open**

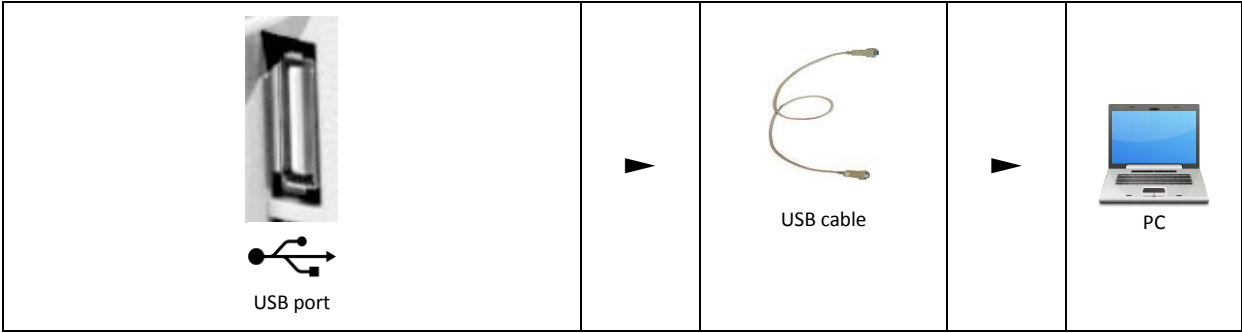
- Start centrifuging.
- When centrifuging process is completed, report will appear. Save report (File/Save us or print it (File/Print).
- In order to get another report, press **New test**.

Connection diagram

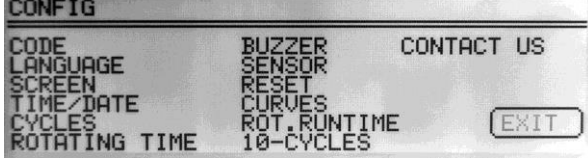


CENTRIFUGE (left-bottom corner)



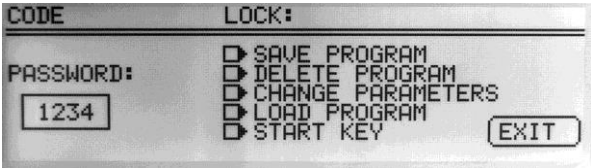
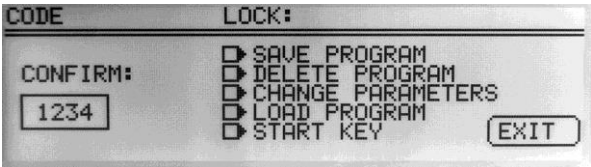
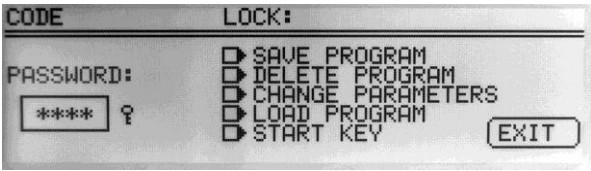
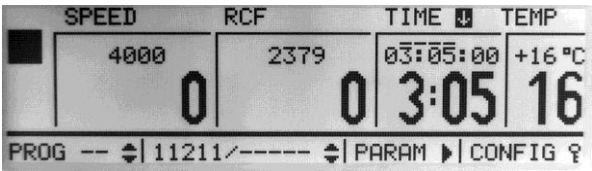


9 Configuration

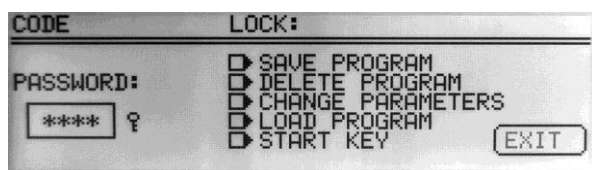
	- Press SET. - With ▲▼◀▶ keys select CONFIG menu. Press SET.
	To navigate in CONFIG use ▲▼◀▶ keys. To enter CONFIG menu press SET.

CODE	password protection
LANGUAGE	menu language
SCREEN	main screen modes
TIME/DATE	time and date settings
CYCLES	total working time, working cycles counter
ROTATING TIME	counting time mode
BUZZER	system sounds
SENSOR	error codes
RESET	restore factory settings
CURVES	user characteristics (ACC, DEC)
ROT. RUNTIME	total running time
10-CYCLES	10 last centrifugation cycles history
CONTACT US	manufacturer's details

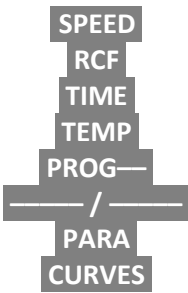
9.1 Password protection

Setting up password	CONFIG / PASSWORD
To prevent from an unauthorized use, a PASSWORD can be set. Note: No PASSWORD is set by default. The PASSWORD can be set as follows when the rotor is at a standstill.	
	- Press the ◀▶ keys until “PASSWORD:” blinks. Press SET. - With ◀▶ keys set the valid 1000s place of the PASSWORD. e.g.: 1xxx. With ▲▼ keys set correct value. - Repeat above steps for all places. - Press SET.
	As a confirmation repeat instructions described above.
When the PASSWORD is set, the Key sign is displayed in the CODE zone. It is also displayed in the main menu (lower right corner of the screen).	
	
From this moment CONFIG menu is protected.	
	
To delete the PASSWORD, “0000” must be set. If the PASSWORD is forgotten, the emergency code “7654” should be used to clear password and remove all locks.	

Setting up locks



- With ▲▼ keys choose a lock.
- Mark a lock by pressing **SET**.
- Repeat above steps for desired locks.
- Leave menu with **BACK** key.

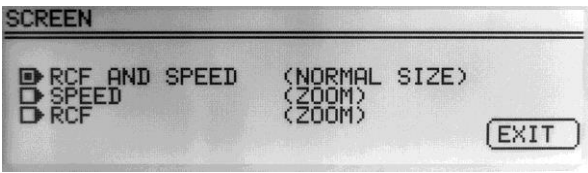
	DISABLED	description
SAVE PROGRAM	 button	▪ no programs can be saved ▪ acceleration characteristics can not be saved ▪ deceleration characteristics can not be saved
DELETE PROGRAM	 button	▪ no programs can be deleted ▪ saving programs on position where one was already stored is disabled
CHANGE PARAMETERS		▪ parameters can not be modified
LOAD PROGRAM	 button	▪ no programs can be called up
START KEY	 key	▪ centrifugation can not be started

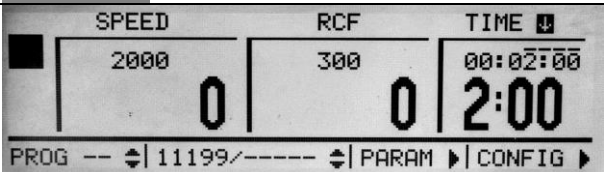
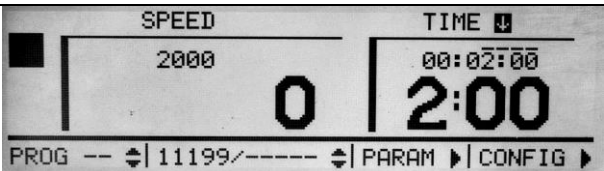
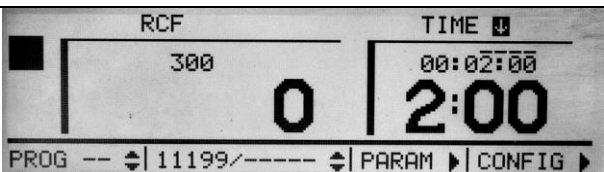
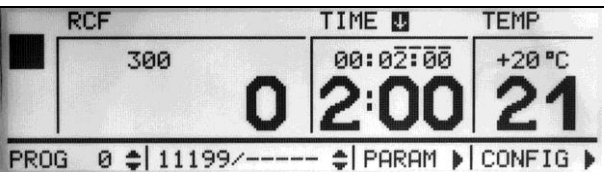
* Executing disabled procedures is only possible after entering the correct

9.2 Language

Choosing menu language.	CONFIG / LANGUAGE
	- With ▲▼ keys select demanded option. - Mark selection by pressing SET.

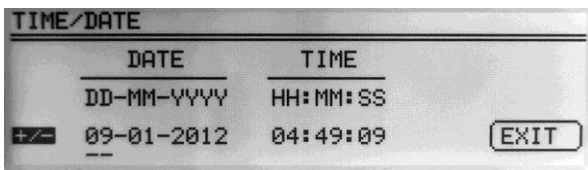
9.3 Main screen modes

Choosing main screen mode.	CONFIG / SCREEN
	- With ▲▼ keys select demanded option. - Mark selection by pressing SET.

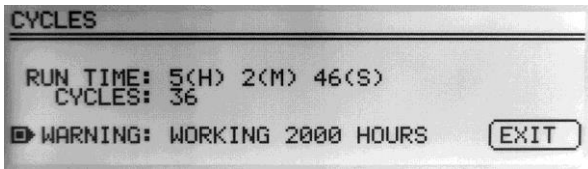
MPW-352	MPW-352R/RH
	
SPEED and RCF	
	
SPEED only	
	
RCF only	

9.4 Time/date

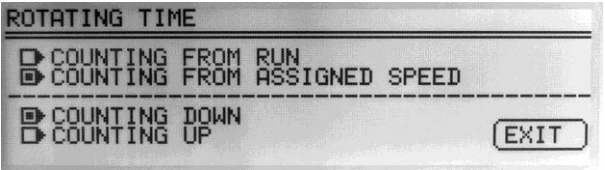
Setting the time and date.	CONFIG / TIME/DATE
----------------------------	---------------------------

	▪ With ▲▼ keys select demanded option. ▪ Mark selection by pressing SET. ▪ With ▲▼ keys select DATE TIME (blinking). Press SET. ▪ With ◀▶ keys place __ under demanded value. Press SET. ▪ With ▲▼ keys change selected value. Accept changes by pressing SET. ▪ Repeat above steps for other values. ▪ Choose EXIT.
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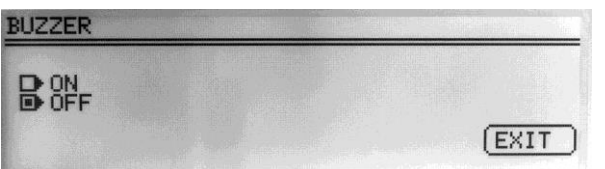
9.5 *Total working time*

Total working time of centrifuge	CONFIG / CYCLES
	In the CYCLES menu the following statistics are displayed: ▪ total working (centrifugation) time ▪ working cycles counter When the total working time is greater than 2000h, the warning splash screen will be displayed every time the centrifuge is switched on. In case the centrifuge should be examined by the manufacturer's service. Warning message can be disabled. In order to it follow the instructions below: ▪ With ▲▼ keys choose WARNING: WORKING 2000 HOURS. ▪ Press SET until ☐ disappears. ▪ Choose EXIT. The CYCLE WARNING MESSAGE is turned on by default.

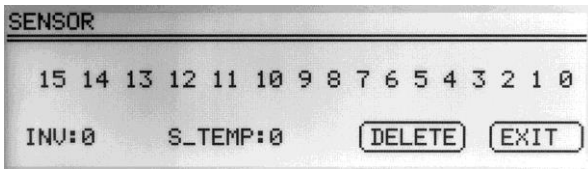
9.6 Rotating time

Counting time mode	CONFIG / ROTATING TIME
	- With ▲▼ keys select demanded option. - Mark selection by pressing SET.
Counting since: START key is pressed COUNTING SINCE ROTOR IS IDENTIFIED - preselected speed is reached COUNTING FROM ASSIGNED SPEED	
Presenting mode: - remaining time COUNTING DOWN - left time COUNTING UP	

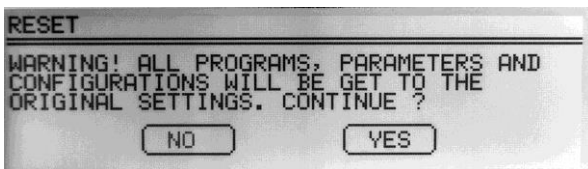
9.7 Sounds

Switching ON/OFF short audible signals accompanying every pressing of any key.	CONFIG / SOUNDS
	- With ▲▼ keys select demanded option. - Mark selection by pressing SET.
Warning signals connected with error occurrence, cannot be switched off.	

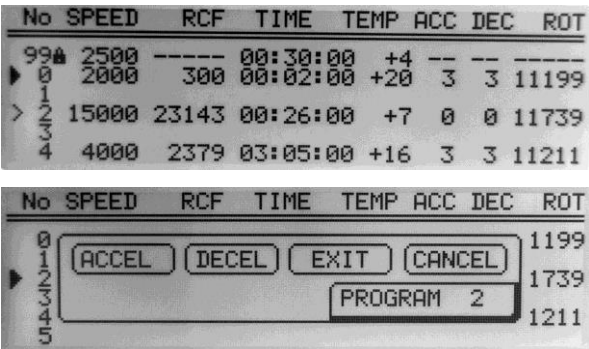
9.8 Error codes

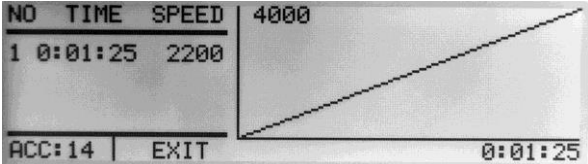
Information about errors arisen in working of the centrifuge.	CONFIG / SENSOR
Intended for service purposes!	
	▪ In any moment, it is possible to delete the contents of the fold. ▪ For this purpose, choose DELETE button (blinking when marked) and confirm by pressing SET key.

9.9 Factory settings

Restoring factory settings.	CONFIG / RESET
All menu settings will be restored to its original values.	
	▪ With ▲ ▼ keys select YES or NO. ▪ Confirm by pressing SET.

9.10 User characteristics ACCEL/DECEL

User acceleration/deceleration characteristics	CONFIG / CURVES
 The screenshot shows a table with columns: No, SPEED, RCF, TIME, TEMP, ACC, DEC, ROT. It lists four programs. Below the table, there are buttons for ACCEL, DECEL, EXIT, and CANCEL, and a field for PROGRAM 2.	- Choose the program by pressing ▲▼ keys. Press SET. - To edit acceleration characteristic choose ACCEL (by pressing ◀▶). Confirm selection by pressing SET.

Acceleration characteristic	CONFIG / CURVES / ACCEL	
After choosing CONFIG → CURVES → ACCEL the window of the characteristics wizard will be displayed: Current acceleration characteristic connected with the loaded program will be displayed on the screen.		
	NO.	section no. (max. 4)
	TIME	total acceleration time
	SPEED	final RPM
	ACC:11	characteristic's no. (10-19)

In the first moment, the EXIT field is marked (the message is blinking). Pressing the SET key will cause returning to the CONFIG / CURVES fold, without making changes in the acceleration characteristics.

„1” SECTION

After setting the time the device will proceed to setting the speed of the given section of characteristics (only the set value SPEED blinks). With UP and DOWN keys one should set the speed value and press the SET key.

The set speed value is limited by the maximum speed of the rotor connected with the edited program. After the end of programming the speed, the graphical displaying of the section (of all sections) will occur TIME+SPEED of the user's acceleration characteristics.

After programming the section 1, there is a possibility to program the next section, number 2:

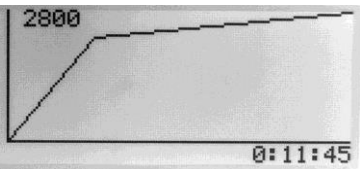
„2” SECTION

NO	TIME	SPEED	2200
1	0:01:25	2200	
2	0:04:10	2800	
ACC:14	EXIT	0:05:35	

Programming of new section possible (the whole line 2 is blinking). Programming as in the case of section 1. It is possible also to abandon the programming: with UP/DOWN keys choose the EXIT option (it will blink) and save (press the SET) only the acceleration characteristics of 1 section with TIME/SPEED parameters described in the line 1.

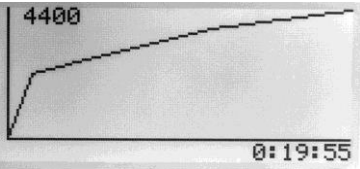
The minimal speed of the next section of acceleration characteristics is equal to the speed of the already programmed previous section.

„3” SECTION

NO	TIME	SPEED	2800
1	0:01:25	2200	
2	0:04:10	2800	
3	0:06:10	3700	
ACC:14 EXIT			0:11:45

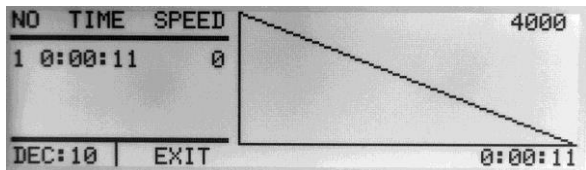
Programming of new section possible (the whole line 3 is blinking). Programming as in the case of section 1. It is possible also to abandon the programming: with UP/DOWN keys choose the EXIT option (it will blink) and save (press the SET) only the acceleration characteristics of 2 section with TIME/SPEED parameters described in the line 1 and 2.

„4” SECTION

NO	TIME	SPEED	4400
1	0:01:25	2200	
2	0:04:10	2800	
3	0:06:10	3700	
4	0:08:10	4400	
ACC:14			0:19:55

Programming of new section possible (the whole line 4 is blinking). Programming as in the case of section 1. It is possible also to abandon the programming: with UP/DOWN keys choose the EXIT option (it will blink) and save (press the SET) only the acceleration characteristics of 3 section with TIME/SPEED parameters described in the line 1, 2 and 3.

Repeated attempt to program already programmed sections of the acceleration characteristics will cause beginning of programming of the whole acceleration characteristics once again (with settings of the program loaded to edition).

Deceleration characteristic	CONFIG / CURVES / DECEL	
After choosing CONFIG → CURVES → DECEL the window of the characteristics wizard will be displayed: Default deceleration characteristics connected with the loaded program will be displayed on the screen. Creating of deceleration characteristics takes place a little differently than acceleration characteristics.		
	NO.	section no. (max. 4)
	TIME	total acceleration time
	SPEED	final RPM
	DEC:11	characteristic's no. (10-19)

In the first moment, the EXIT field is marked (the message is blinking). Pressing the SET key will cause returning to the CONFIG / CURVES fold, without making changes in the deceleration characteristics.

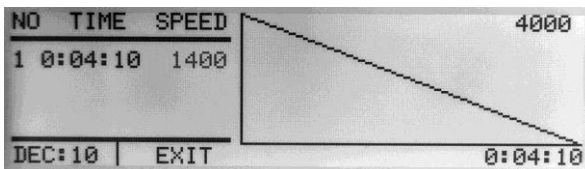
„1” SECTION

To edit the deceleration characteristics, one should mark the section of characteristics with UP or DOWN key (the whole TIME+SPEED line will begin to blink; at this stage, it is only one section, with the number 1) and then press the SET key. The device will proceed to setting the characteristics' section time (only the set TIME value is blinking). With UP and DOWN keys, one should set the required time value and press the SET key.

In order to complete the creation of the deceleration curve it is necessary for the speed of the last of programmed sections of the curve to be equal = 0. Otherwise the curves wizard will not enable the end of programming (it will be impossible to select the EXIT option).

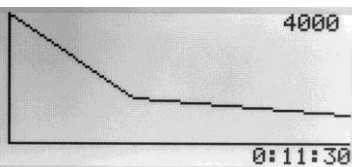
After programming the section 1, there is a possibility to program the next section, number 2:

„2” SECTION

	New section programming possible (the whole line 2 is blinking). Programming as in the case of the section 1. To stop creating the deceleration curve at the stage of two sections, it is necessary to set the speed in section 2 to 0 and press the SET key.
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The maximum speed of the next section of deceleration characteristic is equal to the speed programmed already of the previous section.

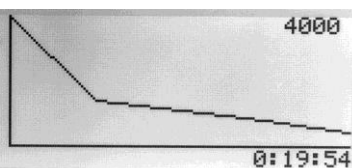
„3” SECTION

NO	TIME	SPEED	
1	0:04:10	1400	
2	0:07:20	900	
3	0:00:00	0	
DEC:10		EXIT	0:11:30

New section programming possible (the whole line 3 is blinking). Programming as in the case of the section 1. To stop creating the deceleration curve at the stage of three sections, it is necessary to set the speed in section 3 to 0 and press the SET key.

„4” SECTION

NO	TIME	SPEED
1	0:04:10	1400
2	0:07:20	900
3	0:05:10	500
4	0:03:14	300



DEC:10 | EXIT

4000

0:19:54

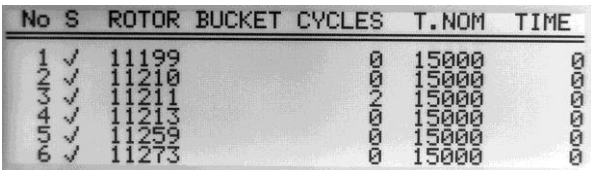
New section programming possible (the whole line 4 is blinking). Programming as in the case of the section 1. If speed of the last section=0, it is possible to save the created characteristics by choosing the EXIT option with UP/DOWN keys and pressing the SET key.

Repeated attempt to program already programmed sections of the acceleration characteristics will cause beginning of programming of the whole deceleration characteristics once again (with settings of the program loaded to edition).

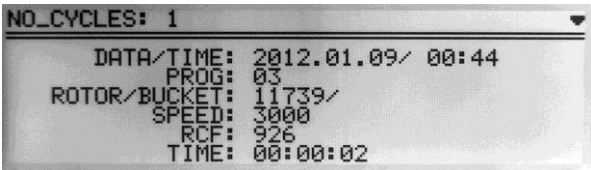
NO TIME SPEED 2110			
1	0	LOAD NEW CURVES ? YES NO PROGRAM: 1	
2	0		
3	0		
ACC		I	0:22

In case of continuing work with currently loaded program with new user characteristics, user should choose YES (to load new characteristics).

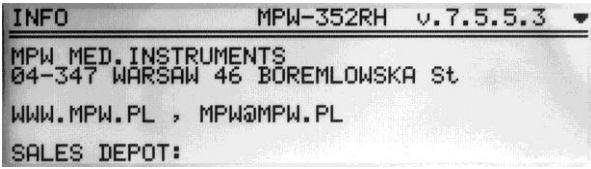
9.11 Rotor runtime

Information about the time of centrifuging and of the quantity of the working cycles of each rotor. The table also contains icons warning of the duty of execution of validation.	CONFIG / ROT. RUNTIME
	- The list can be scrolled using ▲ ▼ keys. - To exit press SET/BACK key. ✓ – more than 100 cycles left ! – less than 100 cycles left ⚠ – worn rotor

9.12 Cycles history

Information concerning parameters of ten last centrifuging cycles.	CONFIG / 10-CYCLES
	- Number of cycle can be changed by ◀ ▶ keys. - The list can be scrolled using ▲ ▼ keys. - To exit press SET/BACK key.

9.13 Manufacturer's details

Information about the type of the centrifuge, firmware version, and contact details.	CONFIG / CONTACT US
	- The list can be scrolled using ▲ ▼ keys. - To exit press SET/BACK key.

10 Maintenance

10.1 *Cleaning of the centrifuge*

	▪ For cleaning, water with soap or other water soluble mild detergent shall be used. One should avoid corrosive and aggressive substances. ▪ It is prohibited to use alkaline solutions, inflammable solvents or agents containing abrasive particles. ▪ Using wiping cloth, remove condensate or residues of the products from the rotor chamber. It is recommended to keep the cover opened when the centrifuge does not work in order to expel the moisture.
	▪ In case the user decides to use centrifuge and equipment cleaning methods other than the ones described in this manual, the user shall contact the device manufacturer in order to check whether the cleaning method chosen does not damage the device.

10.2 *Maintenance of centrifuge elements*

	▪ The rotor pins shall be always lubricated with technical petroleum jelly. ▪ In this way, the uniform deflection of the buckets and quiet centrifuge operation is ensured.
---	--

Cleaning of the accessories

	▪ In order to ensure safe operation one shall carry out in regular way periodical maintenance of the accessories. ▪ Rotors, buckets and round carriers have to withstand steady high stresses originating from the field of gravitation. Chemical reactions as well as corrosion (combination of variable pressure and chemical reactions) can cause corrosion or destruction of metals. Hard to observe surface cracks increase gradually and weaken material without visible symptoms. ▪ In case of observation of surface damage, crevice or other change, as well as the corrosion, the given part (rotor, bucket, etc.) shall be immediately replaced. ▪ In order to prevent corrosion one has to clean regularly the rotor with the fastening bolt, buckets and round carriers. ▪ Cleaning of the accessories shall be carried out outside of the centrifuge once every week or still better after each use. ▪ Then, those parts shall be dried using soft fabric or in the chamber drier at ca.
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	50°C. ▪ Especially prone to the corrosion are parts made of aluminium. For cleaning them one should use neutral agent of pH value 6÷8. ▪ It is forbidden to use alkaline agent of pH > 8. ▪ In this way, the useful service life of the device is substantially increased and susceptibility to corrosion is diminished. ▪ Accurate maintenance increases the service life as well and protects against premature rotor failures. ▪ Corrosion and damages resulting from insufficient maintenance could not be subject of claims lodged against the manufacturer.
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Lubrication

	▪ The rotor pins shall be always lubricated with technical petroleum jelly. ▪ In this way, the uniform deflection of the buckets and quiet centrifuge operation is ensured. ▪ HS accessories maintenance. ▪ Make sure that rubber O-rings are lightly coated with silicone grease. Use high vacuum grease, e.g. type „C” by LUBRINA.
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10.3 Sterilization

One can use all standard disinfectants. The centrifuges and accessories are constructed from various materials and one should to take into account possible variety of materials. During sterilization by means of steam one should to consider temperature resistance of individual materials.

STERILIZATION

	sterilization *	radiation β radiation γ	C ₂ H ₄ O (ethylene oxide)	formalin, ethanol
	121 °C, 20 min	25 kGy		
PS	○	●	○	●
SAN	○	○	●	●
PMMA	○	●	○	●
PC	● ¹⁾	●	●	●
PVC	○ ²⁾	○	●	●
POM	● ¹⁾	●	●	●
PE-LD	○	●	●	●
PE-HD	○	●	●	●
PP	●	●	●	●
PMP	●	●	●	●
ECTFE ETFE	●	○	●	●
PTFE	●	○	●	●
FEP/PFA	●	○	●	●

FKM	●	○	●	●
EPDM	●	○	●	●
NR	○	○	●	●
SI	●	○	●	●

● may be used

○ cannot be used

* Laboratory vessels have to be exactly cleaned and rinsed with the distilled water before the sterilization in the autoclave. It is always necessary to remove closures from containers!

1) The frequent steam sterilization reduces mechanical durability! PC test tubes may become useless.

2) Except PVC hoses which are resistant to the steam sterilization in the temperature 121°C

Chemical resistance of plastics

	aldehydes	cyclic alcohols	esters	ether	ketones	strong or concentrated acids	weak or diluted acids	oxidizing substances	cyclic hydrocarbons	ahs	haloid hydrocarbons	alkalis
PS	○	●	○	○	○	○/●	○/●	○	○	○	○	●
SAN	○	●	○	○	○	○	○/●	○	○	○	○	●
PMMA	○/●	●	○	○	○	○	○/●	○	○/●	○	○	○
PC	○/●	●	○	○	○	○	○/●	○	○/●	○	○	○
PVC	○	●	○	○	○	●	●	○	●	○	○	●
POM	○/●	●	○	●	●	○	○	○	●	●	●	●
PE-LD		●	●	●	○/●	●	●	○	●	●	●	●
PE-HD	●	●	○/●	○/●	○/●	●	●	○	●	○/●	○/●	●
PP	●	●	○/●	○/●	○/●	●	●	○	●	○/●	○/●	●
PMP	○/●	●	○/●		○/●	●	●	○	○/●	○	○	●
ECTFE	●	●	●	●	○	●	●	●	●	●	●	●
ETFE	●	●	●	●	○	●	●	●	●	●	●	●
PTFE	●	●	●	●	●	●	●	●	●	●	●	●
FEP	●	●	●	●	●	●	●	●	●	●	●	●
PFA	●	●	●	●	●	●	●	●	●	●	●	●
FKM	●	○	○	○	○	○	●	○/●	○/●	○/●	○/●	○/●
EPDM	●	●	○/●	○	○/●	●	●	○/●	○	○	○	●
NR	○/●	●	○/●	○	○	○	○/●	○	○	○	○	●
SI	○/●	●	○/●	○	○	○	○/●	○	○	○	○	○/●

●	very good	Permanent action of the substance does not cause damage through 30 days. The material is able to be resistant through years
○/●	good to limited	Continuous action of the substance causes insignificant and partly reversible damage through the period of 7-30 days (e.g. puffing up, softening, reduced mechanical durability, discolouring).
○	limited	The material should not have the continuous contact with the substance. The immediate occurrence of damage is possible (e.g. the loss of mechanical durability, deformation, discolouring, bursting, dissolving).

Plastics

PS	polystyrene	ECTFE	ethylene/chlorotrifluoroethylene
SAN	styrene-acrylonitrile	ETFE	ethylene/tetrafluoroethylene
PMMA	polymethyl methacrylate	PTFE	polytetrafluoroethylene
PC	polycarbonate	FEP	tetrafluoroethylene/perfluoropropylene
PVC	polyvinyl chloride	PFA	tetrafluoroethylene/perfluoroalkylvinylether
POM	acetal polyoxymethylenel	FKM	fluorcarbon rubber
PE-LD	low density polyethylene	EPDM	ethylene propylene diene
PE-HD	high density polyethylene	NR	natural rubber
PP	polypropylene	SI	silicon rubber
PMP	polymethylpentene		



DANGER!

For centrifuging infectious materials it is necessary to use hermetically closed buckets, in order to prevent they migration into the centrifuge.

Rotors, buckets and round carriers can be sterilized in autoclave with temperature 121o – 124°C and pressure 215 kPa during 20 min. In the centrifuge, disinfectants and cleaning agents generally used in medical care should be used (e.g. Aerodesina-2000, Lysoformin 3000, Melseptol, Melsept SF, Sanepidex, Cutasept F).

Additional accessories can be sterilized using autoclave depending on material that they are made of. See table STERILIZATION.



User is responsible for proper disinfections of the centrifuge, if some dangerous material was spilled inside or outside of the centrifuge. During the above mentioned works one must wear safety gloves.

10.4 Chemical resistance

One can use all standard disinfectants. The centrifuges and accessories are constructed from various materials and one should to take into account possible variety of materials. During sterilization by means of steam one should to consider temperature resistance of individual materials.



DANGER!

For centrifuging infectious materials it is necessary to use hermetically closed buckets, in order to prevent they migration into the centrifuge.



User is responsible for proper disinfections of the centrifuge, if some dangerous material was spilled inside or outside of the centrifuge. During the above mentioned works one must wear safety gloves.

11 Troubleshooting

Majority of faults could be removed by switching the centrifuge OFF and then ON. After switching the centrifuge ON, there shall be displayed parameters of the recently implemented program and sound signals comprising four successive tones shall be generated. In case of short-duration power failure the centrifuge terminates the cycle and displays PROGRAM ERROR code.

problem	question	remedy
Centrifuge does not start	<i>Is supply cable plugged into mains?</i>	<i>Plugs supply cable correctly.</i>
	<i>Is master switch ON?</i>	<i>Switch ON power supply.</i>
Motor error is displayed		Call service.
Centrifuge does not start (indications are proof for cycle in progress and motor does not start)	<i>Is  symbol displayed?</i>	Wait till rotor stops and the  symbol goes off.
	<i>Is  symbol displayed?</i>	Close cover.  symbol must switch off.
	<i>Is  symbol blinking?</i>	Centrifugation cycle in progress, press STOP key or wait till cycle ends.
Centrifuge does not accelerate (unbalance error)	<i>Unequal rotor load.</i>	Centrifuge load shall be balanced.
	<i>Inclined centrifuge.</i>	Centrifuge shall be levelled.
	<i>Faulty drive (mechanical damage).</i>	Call service.
	<i>Was centrifuge displaced during operation.</i>	Switch ON the centrifuge again after opening and closing the cover.
(motor error)	<i>After stopping error rotor message is displayed</i>	Check if rotor number in started program is consistent with the number of the rotor installed in the centrifuge. Check rotor status (if there are coding magnets inserted)
	<i>Centrifuge does not recognize the rotor and does not stop.</i>	Switch the centrifuge OFF, then ON and check correctness of loaded program
It is not possible to open the cover	<i> symbol on the display is blinking, after pressing COVER key single tone is audible</i>	Rotor is still rotating. Wait for stopping of the rotor and displaying of the  symbol.
	<i>The sensor is connected correctly, and the error is still applying.</i>	Call service.
Mains failure during run	<i>The message will be displayed on the display about the decay of tension.</i>	Wait for stopping of the rotor, clear the error by pressing the SET key.
Temperature sensor error	<i>The overheating message will be displayed.</i>	Switch the centrifuge OFF, then ON.
		Call service.
Error of the exceeding the temperature (50°C) in the chamber	<i>The overheating message will be displayed.</i>	Call service.



EMERGENCY COVER RELEASE

In case of e.g. mains failure it is possible to open cover manually. At first, one must be sure that rotor is not in the move (use inspection glass). On the right side of the casing there is a lock. Insert emergency opening key (17900) into the lock and turn it counterclockwise.

The cover can be unlocked and opened only when the rotor is in the rest state.

12 Guarantee

Manufacturer grants to the Buyer the guarantee on conditions specified in the Guarantee Certificate. Buyer forfeits the right to guarantee repair when using the device inconsistently with the User manual provisions, when damage results from the User's fault or when the Guarantee Certificate was lost.

Repairs should be carried out in authorized service workshops, granted with the MPW Certificate.

The centrifuge shall be sent to repair after decontaminating disinfections. Information about authorized service workshops could be obtained from the Manufacturer.

13 Disposal



- When you are disposing the device, the respective statutory rules must be observed.
- Pursuant to guideline 2002/96/EC (WEEE), all devices supplied after August 13, 2005, may not be disposed as part of domestic waste.
- The device belongs to 8th group (medical devices) and is categorized in business to business field.
- The icon of the crossed-out trash can shows that the device may not be disposed as part of domestic waste. The waste disposal guidelines of the individual EC countries might vary. If necessary, contact your supplier.

14 Manufacturer's info

MPW MED. INSTRUMENTS

+48 **22 610 56 67**

sales department

22 610 81 07

service

22 610 55 36

fax

Boremlowska 46 Street
04-347 Warsaw

http:// www.mpw.pl
e-mail: mpw@mpw.pl

DISTRIBUTOR:



15 ANNEXES

OPTIONAL ACCESSORIES:

ANGLE ROTORS

cat no.	type	angle	capacity	RPM (max)	RCF (max)	R _{max} [cm]
11199	Angle rotor HSL	45°	12 x 2,2/1,5 ml	18000	24088	6,65
11210	Angle rotor	30°	24 x 15/10 ml	5000	3996	14,3
11211	Angle rotor	30°	10 x 50 ml Falcon	5500	4498	13,3
11213	Angle rotor	30°	8 x 50 ml Falcon	5500	4227	12,5
11259	Angle rotor HSL	45°	30 x 2,2/1,5 ml	15000	24400	9,7
11273	Angle rotor HSL	30°	8 x 30 ml Nalgene	12000	14000	8,7
11456	Angle rotor	30°	36 x 15/10 ml	5000	3996	14,3
11457	Angle rotor HSL	30°	6 x 50 ml Falcon	10000	10732	9,6
11458	Angle rotor HSL	30°	6 x 30 ml Nalgene	15000	19621	7,8
11459	Angle rotor HSL	30°	12 x 10 ml	15000	21381	8,5
11460	Angle rotor HSL	45°	36 x 0,5 ml	18000	29703	8,2
11461	Angle rotor HSL	45°	24 x 2,2/1,5 ml	18000	30065	8,3
11462	Angle rotor HSL	45°	36 x 2,2/1,5 ml	18000	30065	8,3
11465	Angle rotor	30°	30 x 15/10 ml	5200	4020	13,3
11466	Angle rotor HSL	30°	10 x 15 ml Falcon	10000	10732	9,6
11467	Angle rotor HSL	30°	12 x 10 ml	12000	15133	9,4
11468	Angle rotor HSL	45°	6 x 8 x 0,2 ml PCR strip	12000	15294	9,5
11469	Angle rotor HSL	30°	6 x 50 ml Nalgene	12000	14490	9,0
11496	Angle rotor HSL	30°	4 x 85 ml Nalgene	10000	10621	9,5
11501	Angle rotor	30°	30 x 15/10ml	5200	4021	13,3
11503	Angle rotor	40°	8 x Babcock (Gerber 5406)	2000	733	16,4
11585	Angle rotor HSL	45°	12x8x0,2 ml PCR strip	14000	20817	9,5
11586	Angle rotor	30°	6x85 ml Nalgene	7000	6080	11,1
11718	Angle rotor	30°	4x100 ml	6300	5014	11,3
11739	Angle rotor HSL	45°	24x2 ml/filtr	15000	23142	9,2
11740	Angle rotor	30°	12 x 15/10 ml	5500	4058	12,0
11741	Angle rotor	30°	8 x 15/10 ml	6000	4226	10,5
11743	Angle rotor	30°	12 x 30/25 ml	5500	4058	12,0
11746	Angle rotor	30°	6 x 50 ml Falcon	6000	4427	11,0

SWING-OUT ROTORS

cat no.	type	capacity	RPM (max)	RCF (max)	R _{max} [cm]
12172	Swing-out drum rotor	6 adapters 20 x 0,4/0,2 ml or 10 x 2,2/1,5ml	14500	16454	7,0
12177	Swing-out rotor	4 x 250 ml	5000	4724	16,9
12285	Swing-out rotor	2 x 3 MTP and blocks	4300	2398	11,6
12300	Hematocrit rotor	24 capillary tubes 75mm	13000	16816	8,9
12436	Swing-out rotor	4 x 200 ml	5200	4414	14,6
12451	Swing-out rotor	2 x 3 MTP and blocks	3000	1036	10,3
12452	Swing-out rotor	4x2 ml cyto	2500	748	10,7
12464	Swing-out rotor HS	24 x 2,2/1,5 ml	14000	15996	7,3
12582	Swing-out rotor	16 x 8 ml CPT L=130mm	3200	1809	15,8

BUCKETS

Cat. no. Description

13042	Bucket f 30x120 mm for 2x50 ml Falcon test tubes for rotor 12436b;
13044	Hanger for 4 buckets 13080 for 15 ml Falcon test tubes for rotor 12436b;
13045	Bucket f 30x120 mm for 50 ml Falcon test tube for rotor 12436b;
13080	Bucket f 17,7x87 mm for 15/10/7/6 ml test tubes for rotor 11210, 11740, 11456, 11465, 11741;
13081	Bucket f 17,7x65 mm for 10/6/5 ml test tubes for rotor 11210, 11740, 11456, 11465, 11741;
13129c	Hanger for 2 buckets 13080 for 15 ml Falcon test tubes for rotor 12436b;
13174	Round bucket f 62x107 mm for 250 ml bottles for rotor 12177;
13178c	Round bucket f 62x107 mm for 250 ml bottles with cap 17179 for rotor 12177;
13180	Bucket f 30x99 mm for 2 x 50 ml Falcon test tubes for rotor 12177;
13275c	Bucket f 30x99 mm for 50/30/25 ml Falcon test tubes with cap 17151 for rotor 11211, 11213;
13276	Bucket f 30x96 mm for 50/30/25 ml Falcon test tubes without thread for rotor 11211, 11213,
11746;	
13277	Round bucket f 45,5x89,5 mm for 100 ml PP test tubes for rotor 11718;
13286	Bucket 85x130x60 mm for 1-3 microtiter plates and block for rotor 12285;
13307	Bucket 85x130x60 mm for 1-3 microtiter plates for rotor 12451;
13329	Bucket f 25,5x86 mm for 30/25 ml test tubes for rotor 11743;
13437	Round bucket f 57x94 mm for 200 ml bottle No. 15440 and round carriers 14441-14450, 14104, 14106, 14108, 14109, 14110, 14112, 14113 for rotor 12436b;
13438c	Round bucket f 57x98 mm for 200 ml bottle No. 15440 and round carriers 14441-14450, 14104, 14106, 14108, 14109, 14110, 14112, 14113 with cap 17111 for rotor 12436b;
13483	Hanger for 4x2,2/1,5 ml test tubes for rotor 12464;
13504	Bucket for Babcock bootles (Gerber 5406)
13583c	Bucket f45x116 for CPT (130 mm) test tubes and round carrier 14584 with cap 17185 for rotor 12582;
13587	Bucket f38,5x90,5 for 85 ml Nalgene test tubes and round carriers 14855, 14856 for rotor 11586;
13593	Bucket f45x94 for 100 ml test tubes and round carriers 14024, 14181, 14186, 14187, 14188, 14189, 14190, 14192, 14196 for rotor 12436b;
13606	Hanger for CYTO container for rotor 12452;
13719	Round bucket f45x96 mm for 100 ml test tubes and round carriers 14024, 14188÷14190, 14192, 14196 for rotor 11718;

CARRIERS

Cat. no. Description

14000**	Adapter 20x0,4 ml for rotor 12172;
14002**	Adapter 10x2,2/1,5 ml for rotor 12172;
14024	Round carrier f44,5 for 15 ml Falcon test tubes (f17x120 mm) for bucket 13593, 13719;
14035	Round carrier f28,5 for 14 ml test tubes (f17x105mm) for rotor 11469;
14071	Round carrier for 30 ml test tubes nr 15055 (f 25x100 mm) for rotor 11457;
14073	Round carrier f29,0 for 10 ml test tubes (f16x100mm) for rotor 11457;
14082	Round carrier f17,3 for 7/5 ml test tubes (f 13,3x100 mm) for bucket 13080 and 13081;
14084	Round carrier f11,0 for 0,5 ml test tubes (f 8,0x30 mm) for rotor 11259, 11461, 11462, 11739;
14089	Round carrier f29,0 for 15 ml Falcon test tubes (f 17x120 mm) for rotor 11457 and bucket 13275, 13276;
14104	Round carrier f56,5 for 1x100 ml test tubes (f 46x100 mm) for bucket 13437, 13438;
14106	Round carrier f56,5 for 7x7 ml test tubes (f 13x100 mm) for bucket 13437, 13438;

14108	Round carrier f56,5 short for 7x10 ml test tubes (f 17,1x85mm) for bucket 13437, 13438;
14109	Round carrier f56,5 short for 7x5 ml test tubes (f 13x85 mm) for bucket 13437, 13438;
14110	Round carrier f56,5 for 7x14/10 ml test tubes (f 17,1x113 mm) for bucket 13437 i 13438;
14111	Round carrier f56,5 for 5x15 ml test tubes (f 16,7x100 mm) for bucket 13437 i 13438;
14112	Round carrier f56,5 for 3x30/25 ml test tubes (f25,5x100 mm) for bucket 13437 i 13438;
14113	Round carrier f56,5 for 50 ml Falcon test tubes (f30x120 mm) for bucket 13437 i 13438;
14126	Round carrier f11 for 0,4 ml test tubes (f5,8x46 mm) for rotor 11259, 11461, 11462, 11739;
14133	Round carrier f10,8 for 0,2 ml test tubes (f6,2x21 mm) for rotor 11259, 11461, 11462, 11739;
14134	Round carrier f7,8 for 0,2 ml test tubes (f 6,2x21 mm) for rotor 11460;
14149	Round carrier f16,8 for 4 ml test tubes (f14x46 mm) for rotor 11459;
14151	Round carrier f61 for 1x100 ml test tubes (f 46x100 mm) for bucket 13174, 13178;
14152	Round carrier f61 for 1x50 ml Falcon test tubes (f 30x120 mm) for bucket 13174, 13178;
14153	Round carrier f61 for 5x15 ml Falcon test tubes (f 17/22x120 mm) for bucket 13174, 13178;
14154	Round carrier f61 for 9x 5 ml test tubes (f 13,5/17x81 mm) for bucket 13174, 13178;
14155	Round carrier f61 for 12x7/5 ml test tubes (f 13/14,5x100 mm) for bucket 13174, 13178;
14156	Round carrier f61 for 8x14/10 ml test tubes (f 17/17,7x113 mm) for bucket 13174, 13178;
14157	Round carrier f61 for 4x15 ml test tubes (f 17/22x120 mm) for bucket 13174, 13178;
14158	Round carrier f61 for 12x2,2 ml Eppendorf test tubes (f 11x43 mm) for bucket 13174, 13178;
14159	Round carrier f45 for 1x50 ml test tubes (f 35,5x100 mm) for bucket 13174, 13178 and round carrier 14151;
14160	Round carrier f61 for 3x30/25 ml test tubes (f 25,5x100 mm) for bucket 13174, 13178;
14181	Round carrier f44,5 for 5x2/7 ml test tubes (f12,5x58 mm) for bucket 13593;
14186	Round carrier f44,5 for 4x7 ml test tubes (f13,1x100 mm) for bucket 13593;
14187	Round carrier f44,5 for 4x10 ml test tubes (f16,5x100 mm) for bucket 13593;
14188	Pad under 100/50 ml test tubes for bucket 13593, 13719;
14189	Round carrier f44,5 for 50 ml Falcon test tubes (f 30x120 mm) for bucket 13593, 13719;
14190	Round carrier f44,5 for 50 ml test tubes (f35,5x100 mm) for bucket 13593, 13719;
14192	Round carrier f44,5 for 50 ml test tubes (f35,5x100 mm) for bucket 13593, 13719;
14196	Pad f44,5 under 100 ml test tube for bucket 13593, 13719;
14248	Round carrier f29,8 for 30/25 ml test tubes (f 26x100 mm) for bucket 13275 and 13276;
14255	Round carrier f25 for 7 ml test tubes (f 13x100 mm) for bucket 13329;
14256	Round carrier f25 for 15/10 ml test tubes (f 17x120 mm) for bucket 13329;
14441	Round carrier f56,5 for 12x7/6 ml test tubes (f 12,3x100 mm) for bucket 13437 and 13438;
14444	Round carrier f56,5 for 1x50 ml test tubes (f 35,2x100 mm) for bucket 13437 and 13438;
14446	Round carrier f56,5 short for 12x5 ml test tubes (f 12,5x75 mm) for bucket 13437 and 13438;
14447	Round carrier f56,5 for 12x1,2 ml S-Monovete test tubes (f8x66 mm) for bucket 13437 and 13438;
14449	Round carrier f56,5 for 4x12 ml Monovete test tubes (f 17,1/19,4x60/107 mm);
14450	Round carrier f56,5 for 9x2,2/1,5 ml test tubes (f 11x38,5 mm) for bucket 13437 and 13438;
14505	Carrier for Babcock bottles (Gerber 5406)
14584	Pound carrier f44,5 for 4x8 ml CPT test tubes (f 16x130 mm) for bucket 13583.

ATTENTION! ** – available on special request

HS – hermetically sealed

TUBES

Cat. no. Description

15015	Polypropylene test tube 2 ml with cap (f 10,8x41,2 mm);
15016	Polypropylene test tube 1,2 ml S-Monovette with cap (f 8,8/13,4x82,3mm);
15040	Polypropylene test tube 100 ml with cap (f 44,5x103 mm);
15046	Polypropylene test tube 14 ml with cap (f 16,8x113 mm);
15048	Polypropylene test tube 15 ml Nalgene (f 16x113 mm);
15050	Polypropylene test tube 15 ml Falcon (f 17/21x120 mm);
15051	Polypropylene test tube 50 ml Nalgene (f 28,8x106,7 mm);
15052	Polypropylene test tube 50 ml Falcon (f 30/35x120 mm);
15053	Polypropylene test tube 10 ml with cap (f 16/19x100 mm);
15054	Polypropylene test tube 6 ml with cap (f 11,5x92 mm);
15055	Polypropylene test tube 30 ml with cap (f 24,8x100 mm);
15056	Polycarbonate test tube 30 ml Nalgene with cap (f 25,5x94 mm);
15067	Polycarbonate test tube 85 ml Nalgene with cap (f 37,8x106 mm);
15098	Capillary tube stoppers;
15100	Microhematocrite capillary tubes, heparinized (1,4x75mm);
15102	Micro titer plate with cap (85,5x127 mm);
15115	Glass tube 100 ml (f 45x100 mm);
15116	Glass tube 50 ml (f 35x100 mm);
15117	Glass tube 25 ml (f 25x100 mm);
15118	Glass tube 10 ml (f 16x100 mm);
15119	Glass tube 7 ml (f 12x100 mm);
15120	Glass tube 5 ml (f 12x75 mm);
15121	Polypropylene test tube 10 ml with stopper (f 17x70 mm);
15123	Polypropylene test tube 2,2 ml with cap (f 10,8x43 mm) to the deposit CYTO;
15124	Polypropylene test tube 0,4 ml (f 5,7x46 mm);
15125	Polypropylene test tube 0,2 ml PCR (f 6x21 mm);
15127	Polypropylene test tube 0,5 ml with cap (f 7,8x30 mm);
15128	Polypropylene test tube 1,5 ml with cap (f 10,8x39 mm);
15130	Polypropylene PCR test tube 8x0,2 ml (f 6x21 mm);
15131	Polypropylene PCR test tube 4x0,2 ml (f 6x21 mm);
15175	Polypropylene bottle 250 ml Herolab (f 61,5x125 mm);
15176	Polycarbonate bottle 250 ml Herolab (f 61,5x135 mm);
15419	Polypropylene test tube 5 ml (f 12x75 mm);
15424	Polypropylene test tube 30 ml Nalgene with cap (f 25,5x94 mm);
15440	Polypropylene bottle 200 ml (f 56,5x113 mm);

OTHER ACCESSORIES

Cat. no. Description

16598	Zestaw do rejestracji parametrów pracy poprzez złącze USB;
16135	Flat hematocrit reader;
16594	Data recording set of working parameters by serial RS 232 pin;
16164	Round hematocrit reader;
16610	Cyto-container complete for hanger No. 13606;
16614	Microscope slide for cyto-container No. 16610;
16616	Filter card f 9.5 mm for cyto-container No. 16610;
16617	Filter card f 12.5 mm for cyto-container No. 16610;
17111	Polycarbonate cap for bucket No. 13438;
17151	Polycarbonate cap for bucket No. 13275;
17179	Polycarbonate cap for bucket No. 13178
17185	Aluminum cap for bucket No. 13593.



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E-mail: mpw@mpw.pl, www.mpw.pl



- Certified Management System
- DIN EN ISO 9001
- DIN EN ISO 13485

STATEMENT OF CONFORMITY

No 10.352.03/ENG

We, „MPW Med. instruments” Spółdzielnia Pracy
46 Boremlowska Street, 04-347 Warsaw,
Poland

hereby declare under our sole responsibility that the following machine is in accordance with the regulations of the EU Directive 98/79/EC – *in vitro* diagnostic medical devices – due to its conception and design.

Machine:	Laboratory centrifuge
Type:	MPW – 352
Catalog No:	10352
Product classification on the basis of the Directive 98/79/EC	Non classified to list A or B and not for self-testing

Applied harmonized standards:

PN-EN ISO 13485:2005	PN-EN 61010-1:2011
PN-EN 61010-2-020:2008	PN-EN 61010-2-101:2005
PN-EN 61326-2-6:2006	PN-EN ISO 14971:2011
PN-EN 13612:2006	PN-EN 980:2010
PN-EN ISO 18113-3:2011	PN-EN 62366:2008
PN-EN 62304:2010	

MPW Med-instruments
SPÓŁDZIELNIA PRACY
(1) w Warszawie

Warszawa, 12.03.2013



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E-mail: mpw@mpw.pl, www.mpw.pl



- Certified Management System
- DIN EN ISO 9001
- DIN EN ISO 13485

STATEMENT OF CONFORMITY

No 10.352R.03/ENG

We, „MPW Med. instruments” Spółdzielnia Pracy
46 Boremłowska Street, 04-347 Warsaw,
Poland

hereby declare under our sole responsibility that the following machine is in accordance with the regulations of the EU Directive 98/79/EC – *in vitro* diagnostic medical devices – due to its conception and design.

Machine:	Refrigerated laboratory centrifuge
Type:	MPW – 352R
Catalog No:	10352R
Product classification on the basis of the Directive 98/79/EC	Non classified to list A or B and not for self-testing

Applied harmonized standards:

PN-EN ISO 13485:2005	PN-EN 61010-1:2011
PN-EN 61010-2-020:2008	PN-EN 61010-2-101:2005
PN-EN 61326-2-6:2006	PN-EN ISO 14971:2011
PN-EN 13612:2006	PN-EN 980:2010
PN-EN ISO 18113-3:2011	PN-EN 62366:2008
PN-EN 62304:2010	

MPW Med-instruments
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- Certified Management System
- DIN EN ISO 9001
- DIN EN ISO 13485

STATEMENT OF CONFORMITY

No 10.352RH.03/ENG

We, „MPW Med. instruments” Spółdzielnia Pracy
46 Boremłowska Street, 04-347 Warsaw,
Poland

hereby declare under our sole responsibility that the following machine is in accordance with the regulations of the EU Directive 98/79/EC – *in vitro* diagnostic medical devices – due to its conception and design.

Machine:

Refrigerated and heated laboratory centrifuge

Type:

MPW – 352RH

Catalog No:

10352RH

Product classification
on the basis of the Directive
98/79/EC

Non classified to list A or B and not for
self-testing

Applied harmonized standards:

PN-EN ISO 13485:2005
PN-EN 61010-2-020:2008
PN-EN 61326-2-6:2006
PN-EN 13612:2006
PN-EN ISO 18113-3:2011
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PN-EN 61010-2-101:2005
PN-EN ISO 14971:2011
PN-EN 980:2010
PN-EN 62366:2008

MPW Med-instruments
SPÓŁDZIELNIA PRACY
(1) w Warszawie

Warszawa, 12.03.2013

DECLARATION OF DECONTAMINATION

In order to protect our employees please fill out the declaration of decontamination completely before sending centrifuge to the manufacturer (repair).

1. **Device**

– type:

– serial No.:

2. **Description of decontamination**

(see user manual)

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3. **Decontamination carried out by:**

– name:

4. **Date and signature**

.....

DECLARATION OF DECONTAMINATION

In order to protect our employees please fill out the declaration of decontamination completely before sending centrifuge to the manufacturer (return).

5. **Device**

– type:

– serial No.:

6. **Description of decontamination**

(see user manual)

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7. **Decontamination carried out by:**

– name:

8. **Date and signature**

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